

# COMPUTER WORLD

## THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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### NEWS IN BRIEF

#### DEC Employee Steals Parts to Build Mini

MAYNARD, Mass. — A computer programmer employed by Digital Equipment Corp. (DEC) has been charged with stealing components of a minicomputer system.

Stephen Roy, 18, of Maynard was arrested last week and charged with larceny of equipment that local police estimated could total up to \$75,000. Most of the equipment was seized by Connecticut State Police at Aquagigue, Inc., a Bethany, Conn., business run by Roy's father. Police alleged that Roy stole the system components from June to October from DEC and brought the parts to his father's business where he put the system together. Roy's father is said to have thought the parts were salvaged and was unaware of the alleged thefts.

Roy was released on personal recognizance pending a probable cause hearing slated for Dec. 9 in Concord District Court.

#### Berkeley Ordinance Requires Privacy Impact Statements

BERKELEY, Calif. — An ordinance requiring completion of a privacy impact statement and public notification prior to implementing any new or expanded automated personal data systems with city funds has been passed by the City Council here.

The impact statement must include possible adverse effects on the public, as well as the possible ramifications on privacy, credit, employment or insurance activities in the city.

Open-mindedness is encouraged through a provision requiring that alternative systems be studied.

The ordinance stipulates the impact statement must be published in the newspaper of general circulation in the city, and copies must be sent to each member of the City Council as well as any individual or organization with a request on file to receive such documents.

A public hearing is the next step, and any changes made after approval require an additional impact statement.

#### On the Inside This Week

Five N.Y. Men Charged  
In Selling of Licenses

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Survey Finds Users Satisfied  
With Hand-Held Terminal

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## Societies Advance Professional Arts: Sammet

By Nancy French

of the CW staff

CAMBRIDGE, Mass. — "A person who is a professional in the best sense of the word in any field ought to be an active member of at least one society in that field, be it physics or computing or anything else," according to Jean Sammet, president of the Association for Computing Machinery (ACM).

Membership in a professional society isn't just the publications and the special rates for society events. Membership means "helping to advance the art and the science of your profession," she said.

"It's meeting other professionals to

talk over matters that mutually concern you on a basis that you can't get any other way," Sammet, a former ACM vice-president and chairman of the Long Range Planning Committee said.

Sammet brings to the presidency many years of experience in ACM's activities in programming languages. She is programming language technology manager for IBM here and is known worldwide for a work entitled *Programming Languages: History and Fundamentals*, published by Prentice Hall.

Sammet disputes ACM's reputation for being "academically oriented."

"In reality, the ACM is a very diverse

group" — a situation she feels is at the heart of some of the society's present problems.

The special interest groups (SIGs) "run the gamut from people doing pure research in computer science to people who are greatly concerned with the use of the computer in the practical world — to get payrolls out," she explained.

"ACM has not completely solved the problem of how to provide adequate services to groups that are literally at opposite extremes of the spectrum," she explained.

The report of the Long Range Planning Committee, slated for release this

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#### Most Report 'No Problem'

## Election Systems Win Vote Count Race

By Edith Holmes

Close to 70% of the counties serving the 7.5 million voters who turned out last Tuesday to cast their votes by way of computerized devices reported "no problem" with automated balloting. Comments ranging from "smooth as silk," "no hitches at all," "we slept right through it," to "we were done in no time flat," ballots were processed as quickly as they were brought in "and the system worked just beautifully" characterized the tabulation and compilation efforts of well over half the counties interviewed in a random *Computerworld* survey.

Many areas said they'd learned from primary errors and experiences (CW, June 19, Oct. 16). In Bakersfield, Calif., for example, damaged punch cards were not allowed to enter the county's card reader serving as input to an IBM 360/40 as they had during the June election.

"This time we automatically placed any damaged card aside to be counted by hand," Al Meadors, assistant DP supervisor, remarked.

The compilation program used by the jurisdiction encompassing the 172 precincts in Lansing, East Lansing and Meridian, Mich., to generate a summary report on voter statistics was simplified to take into account the sheer volume of data.

"Our compilation system was a disaster in August," John I. Whitmyer, county

clerk for the area, said. "But once we had the system working, reporting our terminals, with readers feeding them the data to go into the computer, we had people waiting for work." He added he was particularly pleased because his staff was operating with "twice the number of candidates on the ballot and one less terminal than it had during the summer race."

By using terminals in local television stations and in a downtown hotel, rather than working from hard-copy printouts, election officials in El Paso County, Colo., were able to increase the speed of their system for reporting returns, accord-

ing to Dick Vogel of Datamanager Associates, manager of the county's in-house computer system. Vogel claimed, "our November election ran even more smoothly than the primary."

#### History Repeats

The survey found, however, that some counties repeated a few of the errors common in this year's preliminary elections.

The card reader on its Burroughs 3500 caused Grand Rapids, Mich., some problems in tabulating its vote in any record time because the device operated so

(Continued on Page 2)

## BankAmericard Institutes Base II 'Value Exchange'

By Don Levitt

Of the CW staff

SAN FRANCISCO — Less "flout" for credit card transactions and less paperwork for member banks are the twin goals of National BankAmericard, Inc.'s (NBI) Base II system that began nationwide operation Nov. 1.

Described by NBI as "the banking industry's largest electronic value exchange

system," Base II eliminates mailing of most BankAmericard sales draft paper among 5,200 member banks but gets the merchant to sign and interchange sales draft paper the bank faster than before.

Completed on schedule after 18 months of effort, Base II now links all 85 BankAmericard processing centers in the U.S. (including Alaska and Hawaii) on a computer-to-computer basis. The system is expected to handle 500,000 to 750,000 interchange items daily this month and as many as a million a day by next March.

Using Base II, the centers no longer separate sort and interchange sales draft paper. Information from the drafts is captured on magnetic tape and transmitted daily to a central NBI computer facility which, in turn, sorts, merges and distributes the data to the appropriate card-issuing processing center.

The paper remains at the merchant bank processing center. Interchange is accomplished overnight, eliminating an estimated six to eight days from the average draft processing and transit time.

The system is being implemented in stages. All processing centers are now receiving incoming draft data, but not all centers are transmitting outgoing data to Base II. Centers not transmitting will, however, be phased into the system

(Continued on Page 6)

## Justice Files Pretrial Brief, Reissues Bid for IBM Breakup

By E. Drake Landell Jr.

Of the CW staff

NEW YORK — The U.S. Government last week said it would prove that IBM possessed monopoly power and had an intent to exercise that power in the upcoming trial against the industry leader.

In a 338 page pretrial brief filed in U.S. District Court here Oct. 21 and made public last week, the Department of Justice said the evidence it would present at the trial would show "the acts, conduct and intent that demonstrate IBM's purpose to maintain its power in the mainframe market area and the peripherals

market."

The filing of the brief comes at a time when rumors — categorically denied by IBM — are circulating that IBM President John E. Opel was in Washington D.C. over the past month and a half discussing a possible settlement of the case with government officials.

While denying Opel was in Washington for the purpose of negotiating a consent decree, IBM spokesmen last week said the company president had visited the capital "a few times" over the past six weeks.

Other industry sources said, however, (Continued on Page 2)

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## U.S. Files Pretrial Brief in IBM Case

(Continued from Page 1)

that Opel had been in the Washington area for the past six weeks and that he had held discussions with both Attorney General William Saxbe and Presidential adviser Philip Buchen. These sources indicated Opel was dealing directly with the administration, thus raising the possibility that IBM might attempt to bypass the antitrust division of the Justice Department in any potential settlement.

## Restructuring Desired

The brief charges IBM with monopoly in both the computer systems market and in the peripherals marketplace and once again calls for a major restructuring of IBM if it is successful in the case. IBM in reaction indicated it could not comment on the government's trial brief except in its own trial brief, which a spokesman said was currently being developed by its lawyers.

However, IBM said, "You should bear in mind... that the Justice brief presents only its side."

The brief, legal sources said, is significant in that it focuses on the IBM bundling practices and once again restates the government's position that IBM should be broken up to relieve the monopolistic state of the industry.

The brief said the government would prove IBM possessed monopoly power through the use of IBM internal statistics, the IBM attempts to impair its own statistics, the admissions of IBM officers and representatives, statistics collected by depositions, independent industry statistics and IBM's dominance in the relevant peripherals markets.

Other items that indicate IBM's monopoly power, the brief continued, are IBM's power over price, including the IBM price umbrella, and IBM's use of price alternatives as a competitive weapon.

Another indication of the IBM monopoly power, the brief said, is IBM's power to exclude competition including General Electric and RCA.

Other indicators of IBM monopoly power include IBM profit levels, barriers to entry and IBM's ability to set *de facto* industry standards.

In the area of IBM control that showed its monopoly position, Justice listed the IBM bundled pricing policy that established a standard for the industry and excluded software companies and consulting services from competition, while at the same time facilitating the market-

ing of IBM systems.

The brief also said IBM had the incentive and ability to undermine but "conspicuously" chose to keep the bundled environment.

In addition, the brief charged that IBM used discriminatory educational allowances in an attempt to forestall developing competition.

In a final area, Justice cited IBM's predatory pricing in the plug-compatible peripherals, disk drive, tape drive, terminal, and add-on memory markets as examples of monopolistic conduct, specifically citing the fixed term and extended term lease plans.

In its conclusion, Justice said the charges outlined "have undertaken to provide a flavor and an understanding of the industry, of the seat of IBM's monopoly power in the market for general-purpose electronic digital computer systems."

## IBM Still Seeks Census Papers

By Molly Noyon  
Of the CW staff

NEW YORK—IBM attorneys have again asked Judge David N. Edetstein to dismiss the Justice Department's antitrust suit against it unless documents compiled by the Census Department on the DP industry are produced within 30 days.

Filings by IBM and its allies by the Justice Department represent the latest round in a continuing wrangle over disclosure of documents sought by IBM for nearly a year under Pretrial Order 11. The documents contain information on the census of DP suppliers.

The Justice Department's reply maintains that refusal to produce the documents "violates the due process clause of the Fifth Amendment to the U.S. Constitution and contravenes the plaintiff's paramount obligation to accord fundamental fairness in proceedings brought because of alleged violations of the federal law."

Basically, the U.S. cannot prosecute an action to enforce federal law and withhold evidence material to defense of the action, IBM argued.

It does not matter that the documents

items." The department also added that "the thrust of the case can be expected to be a long one, even on antitrust standards, in part because IBM's power base in the relevant markets is very broad, touching a very large percentage of the commercial establishments that are the heart of U.S. commerce and industry."

"Its conduct in maintaining that broad power base will be largely reflected in IBM's own documents, honed down from the millions that have been examined... during the years of preparation preceding the trial, still representing an imposing number of potential trial exhibits."

Finally, Justice noted the "purpose of bringing this case was to obtain effective relief and anything less would make structural relief would leave that purpose unfulfilled."

are withheld by an agency other than the prosecutor, it pointed out, citing *Bank Leu v. U.S.*

Noting that the controlling issue is not the language of the Census Act, but the "burden of obligation to furnish information material to the defense under the due process clause, the IBM memo claimed that the Secretary of Commerce does have discretion to produce DP census records.

One section of the U.S.C. holds that the "secretary may furnish transcripts or copies of tables and other census records and make special statistical compilations and surveys for state or local officials, private concerns or individuals upon the payment of the actual or estimated cost of such work."

Previous efforts to dislodge the Census documents have failed.

Justice attorneys rejected an offer by IBM attorneys to follow the procedures used by the parties at the National Security Agency in reviewing the documents.

This would involve "a confidential review of responsive documents by persons having the requisite clearance with a view toward providing a stipulation of fact to be handled in accordance with appropriate protective procedures in lieu of entering into the record relevant facts developed by discovery of the census documents."

## Election Systems Take First in Vote Count Race

(Continued from Page 1)

slowly, a spokesman for the city DP department explained.

The value of educating voters in the art of punch card handling was underscored for Columbus, Ohio, when some absentee votes came in with holes made by a hole punch rather than a pencil or stylus, an election official commented.

As happened in the summer primary, the IBM 360/40 tabulating election results for Athens, Ohio, went down. But at least this time an IBM field engineer was on the premises and the system was up again in two minutes, officials said.

"In the earlier race, we requested assistance from IBM as soon as the system went down, but had to wait an hour for the engineer IBM assigned to us to finish fixing his kitchen sink," one Athens spokesman remarked.

But even those counties experiencing problems indicated they dealt with worse and noted little time was lost in generating results, the survey discovered.

The election returns in Newburyport, Mass., were delayed only 45 minutes when a portion of one vote punch card fell into a puddle on their way to be tabulated at the Chase-Shawmut Co. City clerk George Lawler explained the cards were being carried by a policeman and a

poll worker to the computer center when a catch on the metal carrying case opened and the cards dropped out.

While he conceded a few anxious voters waited for the tally was completed by 10 p.m., after the cards were dried from the exhaust of a large vacuum cleaner and fed into the system.

Despite hardware problems on its Computer Election Systems, Inc.'s Ballot Multiplexer, an election official said Maricopa County, Ariz., completed its returns in a time comparable to that achieved in the primary. "We were stalled only 10 minutes, and completed the tally by 1:30 Wednesday morning," he commented.

Hamilton County, Tenn., experienced some card problems in its final count, according to Tom Moore, registrar-at-large for the Chattanooga area county. "One card was placed into the card reader of the dual 360/40 borrowed from a local bank upside down, and a second ball, a duplicate we punched because the original had been damaged, ended up with an extra punch in the precinct identification code," he explained. "These difficulties delayed results by an hour."

"We hope to eliminate even these small problems when we can dedicate a system of our own to the vote count," he added.

While computer systems can tabulate votes very quickly, those surveyed indicated speed is only an advantage when the system stays in the precinct. If input data is available. With all its absentee ballots in hand, the Datavote system used in Columbus, Ohio, was able to process 70,000 votes in 10 minutes.

But in Lansing, Mich., where precincts from three different counties were tabulated by three different computer systems before being fed into one central machine, officials needed seven hours to process 82,000 ballots, according to county clerk Whittier.

Even though an automated system can't demonstrate its chief advantage until it has the necessary raw data, more time can be spent counting votes by hand. While the computer system worked "without difficulties" in Redford, Mich., write-in votes had to be hand-counted, and officials were up until 4:30 a.m. with these ballots.

And having scrapped its Control Data 1700-based system following miscalculation and delays in the primary (CW, Sept. 18), the Washington, D.C. Board of Elections hoped to complete its hand count of the ballots by the evening of the day following the election.



## PHASE 1 OF SYSTEM LIFE: DESIGN



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But specifications and system charts are tedious and expensive for professional people to complete properly, and to continuously update. Good systems people might like to put all the necessary design specifications on paper in proper form, and give user communications the attention it needs . . . but—all too often—the pressure of more work prevents that from happening.

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Extended Text Composer (ETC), also part of AUTOFLOW II. ETC includes facilities for automatically numbering, formatting, and indexing this material—continuously—whenever text revisions are entered.

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## Search Group, Hruska Back Measure

## Ervin Criminal Records Privacy Bill Gains Support

By Nancy French  
Or the CW Staff

WASHINGTON, D.C. — Leaders in the criminal justice and congressional communities are lining up in support of a proposed bill which would protect the privacy of criminal records and set standards for their use.

At its recent annual meeting in Atlanta, Search Group, Inc. endorsed Sen. Sam Ervin (D-N.C.) bill, S. 2963, while Sen.

Roman Hruska (R-Nebr.), sponsor of a rival law enforcement bill (S. 2964), gave his staff the go-ahead to work with the Ervin group on a compromise bill.

In its resolution, Search called the bill "in the best interest of the criminal justice community. Confusion and inconsistency in the implementation and operation of criminal justice information systems will continue until the Congress has adopted nationwide standards," the resolution affirmed.

Search, now a nonprofit corporation, was originally a 10-state law enforcement group funded by the Law Enforcement Assistance Administration (LEAA) to develop a system of electronic analysis and retrieval of criminal histories.

Hruska, disappointed by the failure of the Justice Department to submit any recommendations on the law enforcement bill he had sponsored in its behalf, wrote Ervin and Attorney General William Saxbe, telling them the time had come to act.

He told Ervin he hoped their staffs would be able to work together to produce a draft that would meet the approval of all concerned.

To Saxbe, Hruska said, "I believe the Subcommittee on Constitutional Rights has been extremely patient in awaiting the recommendations of the Department of Justice. Only a few weeks remain, and my staff, together with [Ervin's staff], intend to face legislation during the present recess."

"Should the [Justice] Department come forth with suggestions during this period they will be given every possible consideration."

#### 'Acceptable Recommendations'

Search's endorsement, approved by the entire membership, was accompanied by a statement that the Ervin subcommittee "can live with," according to one staff member.

Search endorsed the provision of the bill limiting disclosure of arrest records between criminal justice agencies to cases of the agencies' own employment needs, determination of pretrial or posttrial release or detention, preparation of presentence reports or the investigation by a law enforcement agency of an individual who had already been arrested or detained.

The Federal Bureau of Investigation (FBI) had criticized this provision as being "too restrictive."

In Senate hearings this spring, FBI Director Clarence Kelley had warned that the bill failed to recognize all the legitimate needs of criminal justice organizations.

Search's endorsement indicates to many observers that the bill meets local law enforcement requirements after all.

Search objected to a provision that would restrict access to conviction records to the criminal justice administrators except by federal Executive Order.

Search said they preferred that state legislatures rather than the President make that decision.

With regard to access to criminal records, the bill would restrict access to cases where police had positive identification (fingerprint) to prevent police officers looking for a suspect from getting a computer printout on, for example, all black men between the ages of 20 and 30 living in a specific neighborhood who have ever been arrested for burglary — where there was no additional evidence.

Search found the fingerprint requirement too restrictive, suggesting instead that access be granted if police had the name and some other identifying information such as Social Security Number or height and weight, for example.

The group suggested that the Criminal Justice Information Systems Board, created by the legislation, set what minimum amounts of personal identification would be necessary to access a file.

Requiring fingerprints would make the files useless in the investigative stage of crime solution, Search commented.

Search felt unnecessary a provision calling for police to "check back" with an agency that originated an incomplete record before use to assure no disposition had been obtained. Rather than the check-back, Search recommended the originating agency be required to inform

the maintaining agency each time a disposition was obtained.

Search occurred with the bill's definition of sealing, which would on-line computer systems would amount to taking sealed records off-line, and for manual placing them in a separate file container.

#### 'Access for Challenge'

As for the "access for challenge" provision, Search suggested that the challenged agency be required to give notice of that challenge to all persons to whom it had disseminated the record as soon as the challenge was made. The legislation now requires notification only after an official change had been made in a record resulting from a challenge.

In addition, the Ervin bill would require an audit trail be maintained on system accesses. Instead, Search suggested amending the board to establish a specific retention schedule for the logs to eliminate the "nightmare" of keeping access records forever.

Search with regard to investigative files, the Ervin bill would permit automating intelligence or investigative files, but, taking the FBI view, prohibit remote access.

Search recommended permitting remote access, but through a pointer system.

Search endorsed the Criminal Justice Information System Board but recommended that the majority of board members be officials of state and local criminal justice agencies, those groups most affected by the legislation. They recommended further that that board control be limited only to state-created files in the federal system.

Search suggested dropping the Ervin bill's advisory committee, composed of state law enforcement officers who would advise the board of state activities. Instead, it recommended the board be required to consult with state-based groups before issuing regulations.

Search called unfair a provision that would have permitted the board to cut off a whole state from the system if a single section of that state failed to comply with the minimal provisions of the act. It recommended instead that non-compliant states be permitted only to receive unwanted persons information to enable other states to trace fugitives to non-compliant states.

Finally, Search recommended that a national criminal justice information system be established with the participation of all states. Search said that state offenders held in FBI records and single-state offenders held in the respective states, with a pointer system to direct inquiries to the appropriate jurisdiction.

## Inmates Helping Tenn. With Costly Problem And Earning Credits

CENTERVILLE, Tenn. — Residents of a center for youthful offenders here are saving this state part of the expense of hiring private computer services while earning credit toward an associate of arts degree.

The rehabilitation program, developed with state and Law Enforcement Assistance Administration funds, presently trains 26 inmates in keypunching and programming, a Corrections Department spokesman said.

#### Can Apply Credits

Credits earned in the DP courses can be applied to a degree at Nashville State Technical Institute.

Since recent amounts of work have delayed the state's DP facilities and forced it to go to outside services, the inmates are helping the state out of an expensive situation, the spokesman added.

## FBI Switching Draws More Fire

WASHINGTON, D.C. — The Federal Bureau of Investigation's (FBI) proposed "limited" message switching system has drawn fire from still two more high-level critics — Sen. Roman Hruska (R-Nebr.) and Sen. Sam J. Ervin Jr. (D-N.C.), chairman of the Senate Judiciary Committee.

In a joint letter to Attorney General William Saxbe, the two senators asked the Justice Department to delay action on the communications plan until privacy legislation that would control the use of criminal information records and systems used to transmit such data is enacted by the Congress.

The FBI plan, announced in an Oct. 1 memo from Deputy Attorney General Laurence J. Silberman, would give the FBI control over communications linking law enforcement agencies nationwide, an activity which many state-level law enforcement agencies guard jealously.

It would not only duplicate but far surpass the state-run and state-controlled National Law Enforcement Telecommunications System (NLETS), which is still basically a teletypewriter system at this time.

The system already has been criticized

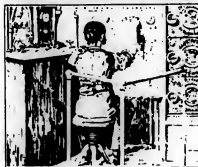
by two White House officials on grounds of placing too much information under the control of a single organization [CW, Oct. 30].

John M. Eger, acting director of the White House Office of Telecommunications Policy, said the decision could "result in the absorption of state and local criminal data systems into a potentially abusive, centralized, federally controlled communications and computer information system."

Douglas Metz, acting director of the Domestic Council Committee on the Right of Privacy, said he was concerned "about the potential impact on individual rights — particularly the right of privacy."

The implementation plan, which Saxbe requested by Oct. 31, has been delayed. A Justice Department spokesman said he expected the "rather extensive report to be out in about two weeks," at which time copies would be circulated to members of Congress, NLETS and the National Crime Information Center, as well as other law enforcement officials whose view and recommendations would be transmitted to the Attorney General as a follow-up to the plan.

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Member Computer Leasing Association

## Sammet Deems Societies a Must For Advancing Professional Arts

(Continued from Page 1)

week, may provide some of the answers members have been looking for, she said. Membership figures reported recently show regular membership barely holding steady at about 20,000 with associate and student memberships down—in the face of a 20% growth rate in the industry.

Some critics attribute the association's zero growth to the cutback in services and dues hike that accompanied recent financial difficulties.

A very successful National Computer Conference in Chicago this spring has provided a financial boost, and the ACM now has a budget surplus for the first time in many years, Sammet indicated.

While Sammet emphasized that a large membership should not be a goal in itself, it is a "measure of how effectively the organization is serving its members. It also provides a financial base that allows the organization to provide better services.

Her strategy, therefore, is to improve ACM's services while building membership as a by-product.

ACM has taken as its first step a membership survey to find out what the members want, rather than "operating on a great many theories of what the members do and don't want and what the members do and don't consist of," Sammet said.

Secondly, a membership profile form is being mailed with each membership renewal to determine members' technical interests and what types of organizations employ them.

Sammet said she has some very basic

## Records Challenger Has Right to Trial

WASHINGTON, D.C.—In a decision that may have far-reaching implications for computerized law enforcement records systems, the U.S. Court of Appeals here has ruled a person seeking to expunge inaccurate information from his Federal Bureau of Investigation (FBI) record is entitled to a trial and the FBI has a duty to make reasonably certain records are accurate.

The ruling was handed down on an appeal by John B. Tarlton Jr., who has an FBI arrest and conviction record.

Tarlton filed a complaint in U.S. District Court in an attempt to delete from his rap sheet certain information he claimed was incomplete and inaccurate.

Tarlton also claimed the information had adversely influenced court in sentencing him and a parole board in denying him parole for an unrelated offense.

The attorney representing the FBI argued Tarlton had no case. The District Court dismissed the case, saying Tarlton failed to state a claim where relief could be granted.

Not satisfied, Tarlton took his case to Appeals Court.

In making its decision, the Appeals Court rejected the FBI's claim that local law enforcement agencies bear the full responsibility for the accuracy of criminal records the FBI circulates for the majority.

"To permit the FBI to disseminate inaccurate criminal information without the FBI making reasonable efforts to prevent inaccurate would be tantamount to permission to accuse individuals of criminal conduct without ever providing such individuals an opportunity to disprove that accusation," Chief Judge David L. Bazelon wrote for the majority.

The case now goes back to District Court where a hearing must be held.

Earlier this year the same Appeals Court ruled that the FBI must strike from its records information that local police later find inaccurate.

The court suggested that the District Court may want to broaden this ruling to require the bureau to initiate action to verify such criminal information.

changes in mind that include more pages in the publications, more lectures for the chapters, some kind of continuing education program at a nominal cost and a significant revision of the ACM Communications.

The complaint usually leveled at the ACM Communications is that as the journal that goes to all the members, it doesn't provide much that most of them find very useful," Sammet said.

"We would like to be able to include more material that would be useful to more members—perhaps in the area of measuring systems, for example, without giving up publishing the research material we currently publish," she said.

As for professional development, most existing programs cost more than the individual can pay, Sammet said. One of her long-range goals, therefore, is to make available one seminar per year as part of ACM membership.



LEO COHEN

ACM has taken as its first step a membership survey to find out what the members want, rather than "operating on a great many theories of what the members do and don't want and what the members do and don't consist of," Sammet said.

Secondly, a membership profile form is being mailed with each membership renewal to determine members' technical interests and what types of organizations employ them.

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## Women in DP: Times Are Changing

CAMBRIDGE, Mass.—"I hope 10 years from now I'm not even asked about women in computing," Jean Sammet, president of the Association for Computing Machinery (ACM), said in a recent interview.

The legal and affirmative action plans now going on to correct discrimination against blacks and other minorities as well as women are "more than long overdue," Sammet said.

However, she was quick to point out that the computer industry has traditionally been "kinder" to women professionals than some of the more exacting fields.

"In the early days there was a myth—a theory—that women made better programmers than men," she explained. "I personally think that's silly, but because that theory did exist, I think men were more inclined to ward hiring women before the days of affirmative action," she said.

"But I made up my mind many years

ago that if I didn't get something to which I thought I was entitled professionally—whether it be a promotion or a raise, for example—I was not going to use the psychological cop-out of blaming it on the fact that I was a woman."

"Of course, one can be naive and fail to realize that one has been discriminated against, but too often, the woman falls on the other side of that psychological trap," Sammet said.

"Until the past five or 10 years the cultural situation in the U.S. made it clear that it was a good thing for men to make personal sacrifices to get ahead professionally and that it was somehow unnatural for women to do the same thing.

"Now I think it's clearly understood that it's okay for women to plan on a career, and they do not need to feel that they cannot be married and have a career, too, if that's what they want," Sammet said.

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Establishes the basic concepts of data communications, the development of the elements of data communication systems. Analyzes the DB system environment in terms of requirements, user interface and performance considerations. Develops all aspects of DB/DC system design, including functional, hardware and software requirements. Examines the role of the data communication packages and describes the properties of several important packages. Examines the properties of several important packages. Examines the properties of several important packages.

### 4 DATA BASE PACKAGE EVALUATION SELECTION (2 days)

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Defines the details of the data base problem in the IMS context of segments, hierarchies and data bases. Analyzes the master design and criteria for access method selection. Develops a segment design, segment construction, reorganization tradeoffs, data set groups and other performance considerations. Examines the simulation and analysis of IMS data base system designs. Examines the simulation and analysis of IMS data base system designs. Examines the simulation and analysis of IMS data base system designs.

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## Added Applicants' Names to Printouts

# Five N.Y. Men Charged in Licenses-for-Sale Scheme

By Edith Holmes  
of the CW staff

BROOKLYN, N.Y. — By adding names to computer printouts of driver license applicants, two state Motor Vehicle Department (MVD) officials allegedly obtained licenses for more than 1,000 people who never passed the required eye, written and road tests.

Two auto school owners were indicted recently along with a Motor Vehicle Department examiner and cashier and charged with participating in the five-year operation. The licenses-for-sale scheme, operating in New York City and Rockland County, was aimed at both recent Chinese and Eastern European Jewish immigrants, according to Eugene Gold, Brooklyn's district attorney.

A fifth man, an employee at one of the schools, was accused of attempting to

convince a witness to lie to the grand jury investigating the racket, Gold added.

Applicants were apparently steered to one of several auto schools in Brooklyn and Queens where they signed blank application forms, the district attorney said. After collecting license fees of \$200 to \$400, the school owners then sent the forms to the two MVD employees at the West Haverstraw office of the department in Rockland County.

### Added to Lists

Applications and phony road test forms were filled out and signed by the examiner and cashier in return for a \$50 to \$125 share of the fee. They then added the names of these applicants to computer lists of those who had legitimately qualified for licenses, Gold said.

He pointed out that, at present the

examiner can properly add names to the computer lists when unscheduled applicants show up to take the tests on a slow day.

Issued licenses through the MVD's dual IBM 360/65 system, applicants requesting chauffeurs' permits were also granted licenses to drive trucks and buses, Gold said.

### No Major Accidents

At least 10 persons who bought such licenses have driven buses in the state, but Gold claimed authorities had no indication that any of the phony license-holders have been involved in major accidents.

The examiner, William Clarkson, retired from the department on April 10, shortly after the investigation began. The district attorney said he was apprehended in Florida and is being charged with 46 counts of forging, receiving bribes, official misconduct and related charges. He

faces up to 42 years in prison if convicted.

The false vision and written test forms were allegedly assigned by George Hohfeld, chief clerk at the West Haverstraw office. Indicted on 11 counts of bribery and related charges, Hohfeld was arrested from the MVD by commissioner Arnold R. Fisher.

Also indicted on bribery, forgery and related charges were Sam Langer, owner of Langer's Auto School, and Abraham Belinsky, owner of Ross Auto School.

Sam Wiesel, a former employee of Langer's, was charged by the grand jury with soliciting perjury in connection with its investigation, Gold said.

The district attorney urged all holders of fraudulent licenses to surrender them voluntarily. Licenses voluntarily turned in are revoked for one year, while those revoked after investigation and conviction can be lost for as long as five years, Gold added.



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## BankAmericard Begins Base II

(Continued from Page 1)

by next March 1, at which time all NBI interchange transactions will be processed electronically.

Base II uses 24K Digital Equipment Corp. (DEC) POP-11/10x installed at seven regional processing centers, linked by out-Wats telephone lines to a 768K IBM 370/145 at NBI's facilities in San Mateo near here. The minis are equipped to handle either 800 bit/in. or 1,600 bit/in. tapes from member banks, as long as the data is in a standardized format.

The system has a four-hour "window" each night during which the 145 pols the centers for incoming data. San Mateo then allows itself two hours to process the data and another four hours to read the draft information and related other data to the receiving centers.

Even in the first week of processing, NBI was reaching an average of 75 of the 85 processing centers each night within the prescribed "windows," and director of system design Irwin H. Derman said he was pleased with that degree of effectiveness.

NBI emphasized that the system is not a master-slave operation. Minis were selected deliberately instead of less "intelligent"

units since they have the logic capabilities to recognize communications errors as they occur, back up to the last known good point and retransmit the data.

Automatic calling facilities at San Mateo and automatic answering facilities at the regional centers allow communications between the minis and mainframe in unattended mode, Derman noted.

Data sent out to the card-issuing centers can be entered directly into description billing runs or used to print facsimile drafts if the cardholder's bank is still on a "country club" billing system, with a need for documentation to support each charge.

NBI supplies member banks with software both to format data being sent into the system and to handle the facsimile draft printing at the end of the cycle. Beyond that, Derman said, the banks are free to process their input and output any way they want.

NBI has given much credit for the successful startup of the system to a range of outside contractors. Compata, Inc., Tazarna, Calif., handled the systems design and integration, systems engineering and technical support functions.

Arthur Anderson & Co. developed the audit control manuals and financially oriented acceptance tests, while Stanford Research Institute worked up the technical acceptance routines. DEC and IBM were saluted for their hardware, and the Bell System was "really great" in putting together the 4,800 bit/sec communications network Base II "depends on," Derman added.

Development of Base II began with a feasibility study during the summer of 1973, following successful implementation of NBI's Base I nationwide authorization system. The functional specifications were drawn up during September and October of 1973 and reviewed with members in November.

"Base II was 18 months from conception to implementation; it was accomplished within its \$7.5 million budget, and investment and operating costs will be recovered within four years," NBI President D.W. Hock noted.

During development of Base II, seven BankAmericard banks from widely separated geographical areas — First National Bank of Arizona, National Bank of Alaska, Indiana National Bank, Colorado National Bank, Chase Manhattan Bank, South Carolina National Bank and American Bank and Trust Co. of Reading, Pa. — participated in a 10-month interim draft transmission test, first eliminating paper interchange among themselves, then running in parallel with Base II, then becoming the first fully operational Base II banks.

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While at the GSA, Mr. Miller authored many solicitation documents and reviewed RFPs submitted by other Federal agencies. He was the project officer for various mandatory requirements contract procurements including areas for tape and disk drives, plug-compatible memories and remote computing services.

Mr. Miller is the President of Government Sales Consultants, Inc., a firm that offers consulting services and seminars to computer-related companies and Government agencies seeking help in ADP procurement.

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**Deliberate or Inadvertent****'Easy Access' Induces Computer Abuse**By Toni Wieman  
Of the CW Staff

QUEBEC CITY—"As long as people have access to assets and records, or if they have access to collusion, theft will occur."

Stan Halper, director of computer audit operations at Coopers and Lybrand, reinforced this statement by noting "there has been a tenfold increase in white collar theft since the advent of the computer" when he spoke at a session of the 16th Annual Information Systems EDP Conference of the National Retail Merchants Association (NRMA) here last week.

"Everyone is facing a problem," Halper stated. "Gradually you are coming off the simple batch system, looking at data bases and seriously considering communications and distributable processing."

"And along with each of these strides forward comes a corresponding responsibility," he noted, "such as the responsibility of audit trails."

Halper said there are two types of fraud: deliberate and inadvertent. The latter is much more

prevalent, he stated.

There are also two types of perpetrator: management—who perpetrates fraud on the board of directors, shareholders, creditors and government—and employees who perpetrate fraud on management.

Delving into the philosophy behind computer abuse, Halper noted management may inadvertently set a policy which, correctly interpreted, results in the system generating distorted financial statements or allowing loss of corporate funds.

"On the other hand, management may inadvertently set a poor policy which allows faulty system design resulting in either loss of corporate assets or a distorted financial statement," he stated.

"Very few management frauds are directed," he said. "Most are inadvertent."

Within the scope of employee fraud, there is the deliberate abuse which takes advantage of system weaknesses, such as in the case of the Westinghouse Appliance or Union Dime Savings Bank frauds, he noted.

Similarly, there can be collusion between employees to override system checks. This, however, occurs only when employees have access to both records and assets, since otherwise there would be no point.

On the more positive side, Halper outlined various detection possibilities.

Deliberate management fraud may be detected by disgruntled employees "who did not get their cut of the take" or by an internal or external audit, he said.

Detection of inadvertent management abuse can result from alternative administrative checks, alert employees or internal or external audits.

The basic elements of computer-oriented internal controls include authorization, recordkeeping and custody over assets.

This includes authorization to process data (a function of assuring that source documents entering the system are valid), to assure prompt and accurate processing of source documents and to interpret, modify or change processing procedures, Halper said.

Recordkeeping controls involve processing data in conformity with authorized specifications, he noted. It also entails assuring accuracy and consistency in processing (through processing and programming controls), keeping custody of and maintaining card and tape libraries and, finally, designing procedures which assure the physical safeguarding of records.

The third control, custody over assets, involves responsibility and accountability for physical possession of assets and the release of such assets only on proper authorization, Halper concluded.

**Privacy Newsletter  
Sends First Issue**

WASHINGTON, D.C.—The *Privacy Journal*, a monthly newsletter covering privacy issues in the computer age, has begun publishing this month.

The newsletter covers state and federal legislation and regulation, new technology, the developing law of individual privacy and public attitudes on privacy. It also relates stories of persons victimized by invasions of privacy.

According to the newsletter's editor, Robert Ellis Smith, formerly the associate director of the Privacy Project of the American Civil Liberties Union and editor of *The Privacy Report*, the first issue contains news of credit reporting companies, student records, medical records, lie detectors and wiretaps, computerized crime files, tax returns and government surveillance, use of Social Security Numbers, computer security and computer crime.

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## 'Reinvention' Wastes Time, Money

# GAO Suggests Sharing of Voting Packages, Systems

By Edith Holmes  
Of the CW Staff

NEW YORK — "Inquiries should be initiated 'to determine the feasibility of producing a standardized package of computer programs and documentation' for use in voter registration systems," according to a report recently released by the General Accounting Office (GAO).

"Constant reinvention" of programs for the generation of such output as poll lists by name or street, party enrollment rosters, special district elections lists and jury lists wastes valuable time, personnel and financial resources, said the study, commissioned by the Clearinghouse on Election Administration within the GAO's Office of Federal Elections.

Conducted by E.R. Shelley & Co., Inc., the study was intended to analyze and evaluate typical state and local voter registration systems. While describing principal methods of registering voters, the GAO report also discussed various alternative plans and made recommendations as to how state and local jurisdictions can establish and maintain improved systems.

### Share Experiences

In addition to urging flexible standard programs for jurisdictions employing automated registration systems, the report recommended the clearinghouse establish a "shared experience bank" open to any registration official or researcher wishing to contribute to or learn from the experiences of other localities. "This bank would be of particular value to data processing groups attempting to design automated systems," the study said.

Noting a traditional mistrust between DP departments and registration staffs, the report suggested federal, state and local governments work to help these groups overcome their "different techni-

cal jargons" through seminars, formal training and self-study courses. Such problems were found to be minimized either where DP personnel were part of registration staffs or where staff members had attended courses in computer concepts and systems design.

Many citizens are disfranchised because of administrative or DP system errors, the researchers learned. To prevent registration documents from being "mislocated, misentered, lost through faulty batch controls or not prepared in time," the study recommended jurisdictions using remotely located DP facilities retain original registration forms and control form copies through batch procedures.

Because duplication of data entry forms also contributes to error incidence, the report urged jurisdictions to redesign registration affidavits or applications to accommodate both physical recordkeep-

ing and data entry requirements. "Reinvention should only be used to handle the exceptions of hard-to-read or damaged source documents," the study added.

"The individual determination and assignment of district and precinct numbers for each voter remains a cumbersome, time-consuming chore," the report cautioned, "unless computer programs are used to automatically insert these codes during the processing of new registration records."

Except for those states requiring or offering automated registration systems, the report said, "little substantive assistance is provided localities," struggling with their development. State election officials should include experienced election registration and DP personnel who would be available to help localities improve their systems.

On the federal level, the GAO study suggested the clearinghouse maintain a data bank to notify all jurisdictions of interstate registration cancellations. "Output could be prepared and sent to each locality in whatever form it desired—printed lists, magnetic tape and so forth. Finally, the report noted administrative costs vary widely among registration jurisdictions, but operating costs for shared DP facilities are fairly consistent. These are "closely approximated" by officials budgeting for new automated systems, the study said, averaging a yearly 20 cents to 25 cents per registered voter.

Because these costs are approximately 20% lower than expenses in localities performing their own processing, the report emphasized jurisdictions should carefully research sharing system design, maintenance and processing costs with other voting districts.

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## Mass. Citizens Learn 'Rights Under Law'

BOSTON — Citizens interested in knowing their legal rights to privacy in this state can read about them now in a pamphlet entitled "Privacy in Massachusetts: Your Rights Under the Law."

Published by the Governor's Commission on Privacy and Personal Data, the booklet covers public records, credit, educational and medical records, as well as welfare, mental and criminal records.

The booklet distinguishes between public records and others and explains in layman's terms who has access to each type and under what conditions.

It also explains how an individual may challenge the information kept about him by consumer reporting agencies as well as agencies of the state government.

The publication is being reprinted and distributed by many community organizations including public defenders groups. Additional information may be obtained from the commission at Room 904, 100 Cambridge St., 02202.

### Oil Spills Spoiled

KINGSTON, R.I. — Oil spills are a costly and ever-present danger to the ecology but now computers can help clean them up, at least here on Narragansett Bay.

Once an oil spill occurs, scientists at the University of Rhode Island have a computer program which pinpoints the slick, its drift and speed so that cleanup crews can contain the pollutant quickly.

The system, actually a computerized model of the bay, can also predict the effect of hurricanes, future water quality and the effects of nuclear discharge.

In a simulated test, the computer has provided accurate information to a corresponding slick movement tracked over a two-day period.

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## Editorials

### If Retailers Can Do It...

The National Retail Merchants Association (NRMA) deserves a commendation for its standardized system to mark department store merchandise.

From the consumer's standpoint, the most significant advantage will be a uniform tag that includes the price of the item at the bottom of the ticket. It is refreshing to see a powerful group, such as NRMA recognize the concerns of the consumer, while attempting to optimize operations through a standard marking system.

The responsiveness of NRMA brings into focus the questionable public acceptance now associated with the first tests of supermarket terminal systems using the Universal Product Code (UPC). The supermarkets will go to great lengths to rationalize on the reasons for eliminating the price on each store item.

The first supermarkets with UPC marking have all kinds of gimmicks to reassure the shopper that a lack of prices won't hurt at all. But explanatory pamphlets, grease pencils to mark their own prices or test scanners for customers to add up their own bills are still a poor substitute for having the price on the top of a can of peas.

NRMA is planning to talk to the supermarket UPC people in an attempt to find a common ground for stores that will use both types of marking systems. We hope the retailers will also talk to their grocery counterparts about the need for price marking.

Meanwhile, it will be very interesting to see the first tests of the NRMA ticketing systems. If the department stores manage to make their operations more efficient with computerized terminal systems — while still retaining visible prices — the consumer will find it hard to understand why the supermarkets have taken their prices away.

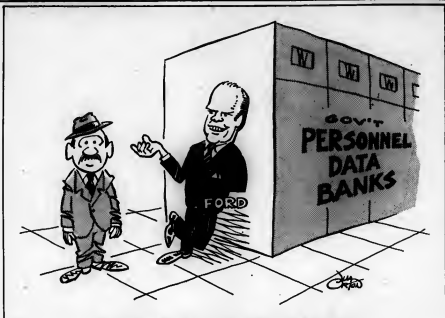
### A Gigantic Rip-Off?

The signals appear to be getting stronger that AT&T has decided to let the Data Access Arrangement (DAA) drift off into oblivion. Regulatory experts in Washington these days talk openly of a Bell System that is defensive against increasing pressure to make some type of compromise on the issue.

The palatable alternative would be a module of the kind agreed to for telephone answering devices. This could be included into non-Bell modems at the factory, thereby saving the cumbersome DAA installation and eliminating the installer not well-versed on DAA and/or data problems and requirements. If this scenario comes to pass, most users and modem suppliers would be happy.

But as the politicians say, let's look at the record. If it really turns out that the now familiar Bell-touted harm from nonconformer devices was never a danger at all, we have been subjected to one gigantic rip-off. And don't forget, fellow phone subscriber, that our money was used to further this phony (no pun intended) campaign with advertising and interminable proceedings before more regulatory agencies than anybody cares to remember.

If indeed the DAA goes down the tubes in favor of a simpler built-in device, how about just one more FCC proceeding? This one would be used to calculate the rebate which Bell should pay to each and every subscriber for having underwritten the cost of supporting this interconnection debacle.



*'Of Course We Believe in Freedom of Information. Isn't Your File Available to Any Agency That Wants It?'*

## Letters to the Editor

### Federal Intervention on Privacy Should Give DPsers More Insight

As professionals we should not be concerned with wishful hopes of curbing congressional intervention into the issues of privacy and crime in the DP business. The government would not have intervened if we were capable of controlling the issues on our own.

We are to expect overnight cooperation and unity within the DP business in drawing up a constitution and bill of rights governing the DP business, then to have the galle to expect the acceptance by Congress of these self-regulations to pardon us from our own self-destruction? In all practicality, the issues on privacy and crime in the DP business are out of our control. The best we can achieve is mutual understanding and consideration between Congress and the DP business when Congress is passing laws and regulations.

The final results of these two "black eyes" should give the DP business further insight into the overall scope of its complexity and its effect on the world today and in the future, therefore making it more aware of the necessity to handle problems within the business, by the business.

Gene M. Leonard

Carson, Calif.

### 'Get Tough' With Companies That Use Underselling Tactics

There are a few very simple steps a prospect can take to counter underselling.

1. Try to buy performance (like response time in an online system) and specify how this performance is to be demonstrated at what time. Never buy solutions (like hardware and software) if you can avoid it.

It is only left that the supplier carry his share of the project risk (that performance will be reached on time for the price agreed upon). As a last resort all suppliers including IBM will sell performance to major accounts or to prestige accounts.

2. If a salesman starts puffing or tries to snow you with simulation results or with the performance of a system like yours in Timbuktu tell him: "This is wonderful. Let's put it in the contract." When he backs down, tell him he is wasting your time, throw him out, call the branch manager and tell him you resent these shady tactics. Ask him whether they are typical of his outfit.

After he says no tell him to assign a salesman to your account who does follow the business practices of the supplier and that you are also beginning to look at alternatives like leasing or competition. The new salesman will be scared and more honest.

3. Before you get tough make sure your boss and, if necessary, his boss agree with your point of view. Many suppliers are good at making an end run trying to isolate you and to have your ap-

proach vetoed from above.

If you get no backing write a polite memo to your boss pointing out the consequences and start looking for another job. If you wait and do nothing you are a candidate for the scapegoat two years hence.

4. If you carry no economic clout, get a copy of the General Services Administration (GSA) contract. If GSA stalls, write to your senator. I did and it works. The GSA contract is the best your supplier will offer to anybody. Use it in negotiations to get better terms. If you are not successful, try leasing and be sure to tell this to the salesman since it affects his commission.

W.W. Leuertz

Consultant

Stamford, Conn.

### Let's Screen Data Bank Consultants

I would like to comment on the Taylor Report published back on July 17 "Should Government Investigate DP Consultants."

I thought the analysis of the lack of documentation and the Mire Report was quite good. However, the intriguing title may warrant a look at a broader framework for professionalism in data processing consulting.

At one time I made a report to the Domestic Council Committee on the Right of Privacy to the effect that one way to secure some control over data bank abuses was to qualify certain individuals for managing these banks. A bill here in California set up some of the machinery to do this, but there has been considerable opposition.

Also, the question is whether outside consultants dealing with data in those banks should also be screened in some way. For example, one of my DP consultant colleagues has had complete access to all the income tax records in California as part of a research project. No formal security clearance was involved.

Our organization, recently reorganized, is attempting to do a small part of this job as a supplement to certification for consultants in DP. We have a program for screening those who can qualify as consultants in this area.

Robert C. Verker

President

Society of Data Processing Consultants  
Los Angeles, Calif.

### This University Is 'Smart'

In response to R.A. Sobieraj and his letter about cross-references, [CW, Oct. 9] I agree there should be a "smart" cross-reference. It appears we are not alone in this feeling. The University of Waterloo has implemented the FULLXREF-SHORT and the XREF-SHORT in the 2.7 release of ASMG.

Ernest W. Cambron

Programming Staff

AT&T Long Lines  
Kansas City, Mo.

## Letters to the Editor

### Certification 'Wrangle' A Positive Interchange

I am ecstatic over the debate between two of our members, Jens Christensen and Harold Estes, and Al Smith about the Certificate of Data Processing (CDP) program, not just because they are Society of Certified Data Processors (SCDP) members, but because the whole interchange is accomplishing something which is very important to us—CDP consciousness raising. Many of Smith's points are worthwhile considering, as have been the rebuttals. Over and above that, the letters from Stephen Kolarik and Jerry Opfin have made a positive contribution.

But all participants in this discussion have omitted one very important fact. In excess of 200 privacy-oriented bills exist around this nation. Some of those 200 are bound to pass, in one form or another.

Senate Bill S. 3418, for instance, when passed, will put into execution something we predicted more than a year ago—a prescreening process for proposed applications. Pennsylvania H.B. 2192 is so stringent in its specifications that it requires close monitoring processes.

As state after state falls into line with the execution of privacy legislation, the question of who will certify these applications will come into being. As Estes stated, some states are considering licensing. This, too, is something we predicted a long time ago.

But we haven't just been talking. We've been doing something

about it. By the time this letter gets in print, the SCDP will have begun to file in every state, and with key federal legislation, a bill to license DP professionals. Provisions of the bill include strict educational and certification provisions, establishment of state boards of review, and the controlled certification of critical consumer-oriented applications.

Kolarik suggested that we take a look at the CDP roster. Yes, there are incompetents and charlatans. No amount of dating of certificates will overcome that. Strengthening the tests, specializing the tests, establishing state-level associations which can challenge the incompetent, unethical or dated individual are a must, and if we can promote it through our efforts, the profession may someday be recognized as a profession.

CDP consciousness raising is an important part of what will have to be done, both by our society and by the holder himself. Key to this is to be the means for the public to be able to locate such a certified individual. It is healthy, therefore, that this "wrangle," as it has been described, is underway.

So, folks, keep criticizing the program; it can be improved by CDPs and non-CDPs alike. But we put all those non-CDPs on notice: the CDP or some other form of certification will ultimately be mandatory under law.

Kenniston W. Lord Jr., CDP  
President

SCDP  
Hudson, Mass.

## Stealing From Pauline to Pay Paul Not Proper in DP

A Detroit newspaper recently carried a story about Pauline, who kept getting bad credit ratings from a credit company. The cause of the ratings had nothing to do with her, but with her father, who apparently had such a rating.

Promises by the newspaper to put matters straight were ineffective, since the identification system which associated credit ratings only used the last name and the first three letters of the first name. Because of this erroneous system decision, Pauline could not get dissociated from her father—who name was Paul.

For Pauline the story has a happy ending. After the newspaper brought the matter to the attention of the firm, it decided something had to be done. It arranged a special flag for the entry to force manual attention.

Lucky for Pauline. But very poor practice for that major credit company—or any DPers.

### The Frustrated Reader

Another paper, the *National Enquirer*, which has probably the largest circulation of any weekly paper in the country, has also started dealing with computers. Not in the "outlining" method used by the Detroit paper, but in the weekly publication of computer "fools." (A computer goof here is something that looks ridiculous from an outsider's point of view, which comes from a computerized sys-

tem.)

A recent week's item concerned a computerized book club service which offered *David Copperfield*, one of Charles Dickens' novels, to its subscribers. In at least one case when the book was ordered, the data entry went wrong and the invoices came addressed to "Mrs. David Copperfield."

Correspondence to both management and to the "Head Computer" (as it was obviously naming the place) was unsuccessful, and only by cancelling out of the club was the subscriber able to get rid of the name.

Another black eye for the capabilities of DP in general.

### Credit to Accounts

A more happy handling of another trouble spot can be seen in the *Fall/Winter Deskins Trading Post* catalog just issued. The cover letter for the catalog says everything purchased at the store is backed by an unconditional guarantee and that if anyone is not satisfied with their purchase they can return it. So far, nothing new.

But the letter goes on to state that if the item has been charged, then the buyer will get a credit to their American Express, Master Charge or BankAmericard account.

And that's it.

So there are three recent examples of handling of trouble spots in the computerized world that the public sees. Let's look at the solutions chosen for each and what the causes were, so far as we can tell.

In the first case, a special exception was made. Therefore, that was a program's type of solution that applied both

From Watson Senior to IBN Saud in three (human) generations—what a paradox! You know, that idea of the Oil Emirate buying in IBM has poetic appeal: I can see Carey, Opel and Co. making the pilgrimage to Mecca, or at least Riyadh, changing the dark-blue suit for white robes and corded head-dress, bowing three times a day toward Amrook (lower-than-county salesmen will be required to prostrate themselves, and anatomically impeccable maps will be issued to World Trade personnel), and continuing to abstain publicly from alcoholic enjoyment. Gorgious!

Of course, the attempts to purchase control will drive the stock up to unimaginable new heights. That will so enrich the Golden Boys that any resistance they might otherwise feel to learning Arabic and eating only with the right hand will be minimized. Assuming that the 75 million shares needed for absolute control would cost from \$150 to \$600 each, a mere 30 or 40 billion petrodollars. Middle East small change—ought to do the trick.

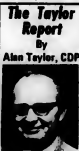
This is certainly a new parameter in the antitrust/monopoly discussion. Would customers, would U.S. competitors, would Japanese competitors—I regard the Europeans as practically moribund already—benefit or be further harmed by a Petrosational Business Machines Corporation? Assuming that the Bo Evanses and the Ted Climbies were left alone, and that the laborers working on ultra-chips were unhindered, and that software artists dreaming about content-addressable memories and virtual virtual processes continued unscathed, I should think the maximum effect would be in sales and at the bar.

In the latter case, overseas ownership would pose enormous additional legal complexities and delays on present and future court actions: no effect on customers, added problems for all competitors. As regards sales, U.S. customers might be somewhat more inclined to go Unisys or Burroughs—especially Jewish ones! On the other hand, nations anxious to butter up the oil boys (I'm thinking of France and Japan) might well be less inclined to encourage or protect their indigenous computer industries, and hence produce more sales for IBM.

To my admittedly parochial eye, the really deep effect would be to restore the old Watsonian "family" attitude. The nationalization, institutionalization, dehumanization, IT-tization of the Gray Gant might well be reversed—and that would be good for us all, competitors and customers and IBM employees alike. Ibn Saud, take it away!



Herb Gross



The Taylor Report  
By  
Alan Taylor, CDP

to the action needed to be taken (manual attention) and to the method of taking it. The cause of the problem was inadequate logic in the program.

In the *David Copperfield* case there was no real solution, just a subscriber being driven away through the misery of one field's contents for another's. The solution again was really an operational one, as was the cause.

In the Deskins case, the cause of credit foul-ups from returned merchandise comes really from the system design of credit as a whole. While goods purchased have to be paid for, such payments can be canceled after purchase if the goods are not as represented or if the store has some appropriate policy—or if they simply do not get delivered.

These cancellations are a normal part of today's business, but the one-way characteristic of credit sales which can carry information from a store to a cardholder is much easier than reversing the process.

Here the solution was created by the real user of the system and it involved taking the problem right out of the hands of the credit card group. It wasn't a system designer's answer, but it took into account both the good and bad system characteristics. And, I think, it will solve the problem for Deskins.

So only Deskins really solved its problem. The credit cards apparently still have a faulty identification system, and the book club can still lose customers. Yet both hire many competent people. Why not apply the solutions to DP problems so uniformly poor?

I think it is because they don't hire DP problem-solvers. They don't even DP system analysts the job of training their selves in problem solution as a specialty.

We have been persuaded in the past to think that systems analysis and programming occur before the DP application is in operation and that only something called "maintenance" action afterward.

Effectively, this is a form of trying to run a large and complex enterprise by absentee management, keeping the man on the spot under orders to change things as little as he can get away with on a day-to-day basis.

But mistakes in items like identification routines, or a failure to issue correct bills, need more changes than the minimum to hide the momentary problems. They need a reworking of the impact of the new knowledge about how the system is actually working—and then the development of a method to remove rather than conceal the problems.

Conceded problems, even when patched over, lead to a deterioration of service. Removed problems lead to an increased quality. It is the lack of such service qualities that gives the DP profession a poor reputation.

The root cause is because we don't employ systems analysts as quality engineers to oversee the quality of the service, leaving it instead to whoever is around to hide the most glaring errors under the rug.

Quality engineers are essential for quality service. The profession should insist upon them being employed for any important system, and certainly for any system which maintains credit records and equally sensitive matters.

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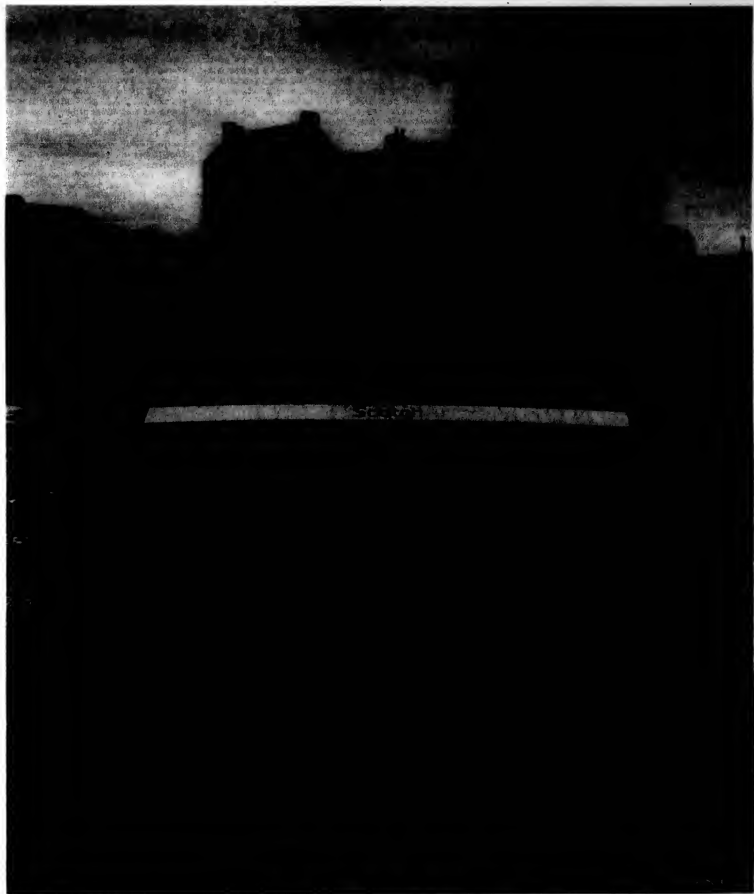
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# Zack R.: The Black Who Played the Game--and Won

By Miles Benson

Special to Computerworld

When they made Zack R. head of software marketing support at Computing Associates Ltd. (CAL), everybody figured he was just the company's token black manager. You know, there's a certain quota to meet if you're an Equal Opportunity Employer, and a few of them

## The Sociology of Computing

ought to be in management positions? Well, CAL hadn't really opposed minority hiring over the years, but it hadn't really fought to make it happen.

But Zack R. had other ideas. He had caught onto the slowwitted, slow-thinking stereotype that white folks had of him more years ago than he could remember.

ber. And he used that stereotype to his own personal advantage.

Zack's mind was as fast as a black Olympic track star and it covered the range of a black blues singer. And he knew that Zack R., well-placed black manager, could use that mind to benefit both his company and his people.

So he hid his time at CAL. He was a good programmer, a good documenter, a good articulator. Not too good, mind you. But good enough to be noticed.

When he took over the software marketing support office, he already had a plan well formulated. Now was the time to give full range to his mind, to push hard to become both a technical and managerial success. And push he did.

The light burned late in Zack's office those first few months. There was a lot of new material to cover. Learn the principals of marketing. Study the company's goals. Identify the company's customer base, present and future. Think about how software fit into all of that.

Top management, at first, was startled at the ferocity of Zack's concentration, but more and more they liked what they saw. Zack was not only smart, he was strong. When he was right, no one, not even a top management group, could bug him. When he was wrong, he learned to admit it.

It was at least a year before Zack's mind and strength so personalized his presence that people who knew him well quit noticing his color. With his breadth and depth of knowledge, Zack's judgments began being corporate decisions. Now Zack was more than accepted at CAL; in many ways, Zack was becoming CAL.

CAL profited. In a time when the stock market plowed like an Everest mountain climber whose hands had gone numb, CAL profited. And grew.

One evening, sitting back in his office chair after a harder day than usual, Zack tried to relax. He looked out his window, out across the city where CAL's offices were located. Nearby he saw professional

office buildings, well-tended lawns, architectural beauty.

Further away, out of sight, were other parts of the city. The black ghetto, made up of many ghettos, a stew from a couple of generations of beating against a system that only allowed the exceptional to succeed. Surrounding it, the white middle-class suburbs, a place that was comfortable in its racial and economic isolation.

The technical tension drained away for a little while. Zack R. knew that CAL became not the finely tuned corporate mind he had become but a human being. He looked down at his hands, unclenched now, just resting on the padded arms of his chair. Black. It was time to begin the second phase of his plan.

If phase one could be characterized as hiding his blackness behind the dazzling light of his mind, phase two was the reemergence of Zack R.'s blackness.

A lot of blacks who make it in the white man's world leave their blackness behind. It's easier that way. Whites don't generally want to hear about the anger in the black community, and less so do they want to do something about it. Blacks call these no-longer-blacks "Uncle Toms." It's a dirty word... like "nigger."

Zack R. had no intention of taking the easy way. It wasn't enough to be making good money, be respected, live well. There was still a monstrous social injustice with which to deal. And Zack was now in a position to help.

It was hard to take the same energy which had gone into software marketing support and split it into two parts and be successful at it. But Zack R. had the brains, and the talent, and the motivation, and he did just that.

Phase two began with Zack dropping a few hints that CAL's Equal Opportunity Program (EOP) needed just cleaned out. The EOP office had become more interested in protecting the company from government investigation than it had in actively promoting Equal Opportunity hiring. That may seem like a minor difference, but the effect in actual terms of successful hiring programs was major.

Zack's hints finally resulted in bringing in a new EOP manager who cared both about being black and helping the company. Minority hiring increased; the minority people who were hired were considerably happier on the job, and they did more and better work.

With EOP cleaned up, Zack began on CAL's subcontract process. Traditionally, pieces of CAL's action were farmed out to well-established subcontractors. That pretty well precluded minority firms from getting any of the work... how many minority companies do you know that are well-established?

Zack had enough going for him at this point to try a technique only a few other companies have used. Building on his well-earned credibility in top management and his newly solidified contact with the black community through CAL's EOP manager, he convinced his company to form its own minority-managed subsidiary to do software work for CAL and other firms, and he bonded together a team of people who could handle the work.

By now, Zack was identified throughout CAL as that "black manager." Most still respected him. Some, entrenched in older ways or fearful of his newly directed drive, could not.

There really isn't any ending to the Zack R. Story. He's still doing a bang-up job in software support. He's still pushing what he calls his "social justice program"—the latest phase is a company subletting program to allow employees who want to play a significant role in positive social change to have a year off with partial pay.

Zack R. won't be able to solve the whole problem. But he'll know—and maybe someday society will know—that he sure tried his best.

How many of us can say the same?

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# SOFTWARE & SERVICES

## Hard-Wired Assembler

### On the Way?

By Don Levitt  
Of the CW staff

SANTA BARBARA, Calif. — Hard-wired assemblers and compilers may be closer than most users would guess. With the advent of such tools, the users will "finally have a chance to break away from the current programming language culture," according to spokesmen at the Research Centre for Mathematics and Morphology.

The center has been working on two separate language systems for more than 10 years, he said, and the systems have progressed from the concept level to the point where they could be implemented "on many different computers." The Universal Assembly Language (UAL) has been installed on a Monroe Litton 1880 Scientist, the center said.

Both UAL and the Syntactic Universal Programming Language (Supl) will be formally announced at a session on machine intelligence at the Third International Congress of Cybernetics and General Systems in Bucharest, Romania, next August.

The goal of UAL is to allow assembly-level source code to be truly transportable between machines. Until now, of course, assembler coding has had to be machine-dependent, utilizing only those instructions the particular CPU was wired to accept.

Instead, UAL implementations would accept a standard range of instructions and then translate them into the machine-level code that would accomplish the goals of the UAL code in the target machine's instruction repertoire.

Supl has a different approach to allow the user to work in the language he is comfortable with, regardless of the CPU he expects to use. The final goal would be to let the user work in his own natural language, the center said.

A study of many natural languages has shown that there are "about 30 basic components" in every one of them.

With that in mind, the center has developed a universal grammar and a generalized syntax scheme. This can be used to accept any language as input and to generate machine code for "any" target machine, as long as the user identifies both ends of the process.

Center spokesmen admitted the basis of Supl is similar to the basis of several systems that are currently in use or well under development. Each system separates the original language from the desired final language.

The center can be reached through P.O. Box 4334 at the Milpas Station, here in Santa Barbara, 93103.

## Navy Tested for '68 Specs

# Speed, Optimized Code Mark CL Cobol

## Includes '74 Features

ALBANY, N.Y. — The CL Cobol system from Computer Linguistics, Inc. (CLI) provides a whole range of supporting services, in addition to a compiler that "passed" the Navy's Cobol audit routines for ANS Cobol 68, and is now being used, according to the vendor, to help shape the audits for ANS Cobol '74. Designed for the IBM 360/370 OS user, CLI Cobol is said to compile an average of 66% faster than IBM's ANS Cobol Version 4. The improvement grows more pronounced as the number of source statements grows, the vendor claimed.

Procedure Division code generated by the new compiler is optimized for storage space and "typically" requires 29% less room than the code put out by IBM's version 4, according to CLI. Results indicate the CLI product beats IBM's optimization routine and at least one of the optimizing packages now on the market from an independent software house.

With fewer instructions to process, CLI Cobol programs generally run faster than those that weren't so well optimized, the vendor added.

The system also provides a source statement efficiency analysis which, at user request, tests each source statement for errors. It issues a warning message whenever it recognizes coding that will produce poor object code, if a better choice is available.

Another user option supports the gen-

eration of either 360 or 370 instructions so that the result is better tuned to the object CPU, the vendor noted.

The compiler is programmed with re-entrant coding techniques allowing multiple users to work with a single copy simultaneously. In addition, output from the processor may also be in re-entrant form at user request.

CLI Cobol is said to support the 1974 ANS extended COPY facility and the standard debugging facilities as well as "many" debugging language extensions. It also includes a batch monitor compatible with Hsp's batching capability to allow "stacking" of jobs, eliminating

most step initiation overhead.

Multiple Cobol programs can also be compiled in a single job step, cutting job submission overhead there as well. Another option allows multiple programs to be compiled, loaded and executed in a single job step, a facility CLI feels should appear particularly to academic installations.

The CLI Cobol system can "function reasonably well" in 86K bytes but will run faster with more memory.

The package leases for \$192/mo which, CLI said, is what IBM will be charging for its ANS Cobol Version 4 in January. CLI is at 24 Aviation Road, 12205.

## Independent Adds to Programs Available to Singer Ten Users

KANSAS CITY, Mo. — Singer System Ten users can look to Software and Systems Management, Inc. (SSMI) for application support with a payroll package already available and an accounts payable package scheduled for early next year. An interface to link the packages into a single integrated system is also under development, the vendor said.

The payroll package has a basic pro-ten payroll function with an add-on con-

struction industry module available, if needed.

The basic system produces payroll checks, check register and deduction reports. It also puts out reports of union dues paid and quarterly earnings and year-to-date earnings reports, as well as such basics as the federally required 941A quarterly reports of Social Security deductions and the employees' W-2 forms at year's end. State tax and check remitting routines are available and can be added as needed, the vendor noted.

The construction industry module puts out a whole range of reports needed for effective project management. These include lists of job costs, bid items and equipment and depreciation reports.

Classification and profit sharing reports complete the output of the construction subsystem, SSMI added.

The accounts payable package satisfies the user's daily accounting functions while providing "significant" management reports. Controls help detect default data by producing reports pointing out areas where fraud may occur, the vendor said.

The package includes the processing of open purchase orders and the generation of receipts and invoices. Check writing and check reconciliation are also part of the package.

Cash requirements projections and vendor purchase summaries are among the outputs.

The packages are designed to run on a Singer System Ten with 10K of common memory and a 10K partition, a model 420R-40 disk drive, a CRT and a printer.

The payroll package sells for \$3,500; the construction industry module costs an additional \$500. The state tax routines can be added for \$150 each, the company said.

SSMI is at 605 W. 47th St., 64112.

## 'Prose' Handles Calculus Coding

LOS ANGELES — Mathematically oriented programmers can pose problems in calculus notation and avoid the "translation" into explicit algebra normally required when using Fortran by utilizing the Prose language system. It is currently available on Control Data's Cybernet service or as a package for in-house use from Prose, Inc.

The language features all the capabilities of contemporary procedural languages, a Prose spokesman said, doing "highly readable" input, automated output, logic path analysis and variable auditing and trapping, as examples.

Prose is said to ease the programming burden at all problem levels from simple arithmetic and algebra, to vector/matrix algebra, to calculus "and beyond," while providing powerful capability at "very high" mathematical levels.

Prose calculus operations are concerned both with differential and integral calculus and with algebraic problems whose solution techniques require the values of derivatives, the spokesman noted.

A partial list of the types of calculations and related problem areas is said to include:

- Automatic evaluation of first and second order analytic derivatives, with

no limit on the number of independent or dependent variables or on the complexity of their relationships.

• Evaluation of maxima and minima of functions with no limit on function complexity or dimensionality.

• Solution of systems of equations, including both algebraic and ordinary differential equations, whether implicit, explicit, linear or nonlinear.

• Solution of process identification problems, boundary value problems and optimal control problems.

The Cybernet implementation provides users with either remote batch or time-sharing versions. The package for in-house use of CDC 6000 Series CPUs is available now in batch mode only under the Scope operating system.

A time-sharing version under Kronos is expected to be ready for release later this year, a spokesman said. The Prose system coding can be run in 42K (octal), but with dynamic storage allocation, programs more typically use 70K (octal) or more.

There is a \$3,000 front-end fee for in-house users, plus \$965/mo under a lease plan, Prose said from 8616 La Tijera Blvd., 90045.

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## Sysgen Made Simple— Part 1

# Thorough Planning First Step to More Efficiency

By Robert T. Alexander,  
James M. Blackford and Fred Schuff  
Special to Computerworld

Once the generation of an operating system on an IBM 360 or 370 has been completed, subsequent SYSGENs are identical in nature and sometimes exact duplications of previous efforts. Each new SYSGEN should be able to use all (or at least most) of the effort expended on the preceding

### Concepts and Techniques

SYSGENs. This is the prime intent of the following procedure. We know it is not an "ultimate" solution but rather a step toward the more efficient and organized SYSGEN processing. In spite of the level of development, the technique has resulted in very substantial rewards in reducing man hours and errors

when performing SYSGENs.

The physical SYSGEN process is "typically" comprised of the following steps:

1. Restore DLIB01 volume from PID release tape.
2. Prepare pre-SYSGEN fixes to be applied to DLIB01 volume data sets.
3. Apply pre-SYSGEN fixes on DLIB01 volume.
4. Initialize new SYSRES volume(s) and load IPL text.
5. Allocate space for system data sets on the new SYSRES volume(s). Allocate work data sets for the SYSGEN. Update the system catalog (SYSTCLG) for the necessary data sets.
6. Prepare the STAGE-I source deck.
7. Run the STAGE-I assembly.
8. Run the STAGE-II job stream created by the STAGE-I assembly.
9. Release work space allocated for the SYSGEN. Update the system catalog

(SYSTCLG) on the new SYSRES volume.

10. Create tape backup of the new SYSRES volume(s).

This procedure may vary slightly from installation to installation, but generally it remains static except for a set of standard parameters that will be set to different values from one SYSGEN to the next. These parameters do not alter the procedure but supply exact values that are unique to the SYSGEN being processed.

Three facilities are necessary to create the proper procedure for the SYSGEN process:

- A method for assembling the job stream in a workable format which is accessible via standard programming facilities.
- A method for modifying that job stream with the appropriate values from the set of standard parameters.

• A method of selectively extracting certain segments of the job stream based on values of the standard parameters and the ability to select particular values from segments of the job stream for a given option within the job stream.

All of these goals were accomplished with the creation of an Assembler language macro, the "P" macro, was written to allow a workable format for this correlation. A "P" macro statement was created for each record of the entire SYSGEN job stream.

The modification of values of the standard parameters set was handled by establishing a symbolic parameter (&symbol) for each of the standard parameters. By using the job stream statements with symbolic parameters instead of the explicit values, the Assembler would make the proper substitution as statements were assembled. Each of the standard parameter sets was defined as a global symbol and a SETC (or SETA) was coded with the desired value for the generation of each particular job stream.

The ability to selectively include or exclude segments or individual records of the job stream was accomplished with the Assembler language conditional assembly feature. The selective process was applied to three separate cases:

- Inclusion or exclusion of complete segments of the job stream.
- Selection of the proper record from several possible records based on the standard parameter set.
- Selection of options within a given macro coded as part of the STAGE-I source deck based on the standard parameter set. With the "P" macro technique, each value within the macros was coded on a separate record (for readability, too) and then the proper "P" macro statement with only a single value needed to be selected.

The output of assembling the master deck of "P" macro statements (and some conditional assembly statements) is the complete job stream required for the SYSGEN. This job stream is intended to perform the 10 steps that comprise a typical SYSGEN process.

The following parameters were sufficient to allow complete flexibility within the SYSGEN procedure that was developed.

- UADLIB\* — Unit address for mounting the DLIB01 volume.
- UANRES\* — Unit address for mounting the new SYSRES volume.
- ID — Generated deck identification (Column 73-74).
- TYPE — Type of SYSGEN to be performed (full, I/O, nucleus, processor).
- N — Generated nucleus identifier (UEANUCM).
- TSO — Inclusion or exclusion of TSO.
- SYSTEM — System identification. Used to select data dependent upon the system (mainframe or alternate nuclei).
- NEWRS\* — Volume serial number of the new SYSRES volume (3330-type device was assumed).
- OLDRS — Volume serial number of the SYSRES volume of the system on which the job stream is being run (3330-type device was assumed).

• NDX\* — Prefix for all data set names on the new SYSRES volume and the work data sets. Also used in STAGE-I GENERATE macro.

• TYPE2 — Method for submitting the STAGE-II job stream for execution via the IEBEDIT OS utility. In this case, Hsp and OS were possible. (With modification, this facility could be extended to any system.)

• CNT2 — Sequence number for labeling the STAGE-II jobs (executed via IEBEDIT) for execution from the

(Continued on Page 18)

## Like to get a completely objective view of the IDMS database management system from actual users?



**Datamation:** September, '74 issue. Article by Mr. Huhn describes actual use of IDMS in handling the major business data processing of a large chemical company. Reprint available. Use coupon below.

**DATAPRO:** October, '74 issue. This newest review of IDMS by DATAPRO not only outlines the structure and general features of IDMS, but also includes interviews with seven IDMS users. Reprint available. Use coupon below.

**EDP-Analyzer:** October, '74 issue. Entire issue devoted to CODASYL, plus Database Management Systems, including systems offered by UNIVAC, Xerox, DEC and Cullinane Corporation. Sorry, no free reprints. But you can purchase from Cullinane Publications.

The three current magazine articles shown above discuss IDMS in a realistic fashion, reflecting the viewpoint of users who've had enough actual experience with the system to give a valid opinion.

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Reprints of two articles (the EDP-Analyzer issue must be ordered from the publisher) and the new brochure are yours free, simply by filling out our coupon. We'll also be giving a limited series of IDMS seminars in Cleveland, New York and San Francisco, prior to the Spring Computer Caravan seminars. Our coupon will bring you complete details.

We won't try to give you a sales talk on IDMS in this ad—except to say that a lot of organizations are buying IDMS despite the

obvious competition of other systems including IBM's.

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Technical Brochure, just published by Cullinane Corporation, is the exactly what we say it is: technical and factual, not promotional. Also includes a list of users. Use coupon below.

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## Sensitive Data Encoded/Decoded With 'Cryptex,' No Passwords

TEANECK, N.J. — Designed for DP environments where confidential information is handled, the Cryptex software from Bi-Hex, Inc., is described as easy to integrate into existing application programs to protect data against unauthorized access.

Cryptex might be used, the vendor suggested, to encode personnel data, payroll files, sales reports, medical records and similar priority information.

It could also be used to encipher telecommunications messages as they pass from one point in the user's net to another, somewhat out of the direct control of the user.

Encoding of archival or dead-storage data is still another possible use for Cryptex and might allow utilization of less expensive space for storage than would be practical if the records were in clear text, Bi-Hex said.

Cryptex can be used to conceal part or all of each record in the user's file. Thus non-sensitive data can be extracted easily through conventional utility programs but the critical data is available only to those who are allowed to have it.

The software encodes and decodes user data by means of a multipass byte trans-

formation controlled by a pseudorandom number generator.

The same process which encodes the data also decodes it, Bi-Hex noted.

Cryptex differs from similar enciphering packages because it does not require a user-supplied code key. This difference also means data does not become inaccessible — even to authorized personnel — if the key is lost or forgotten.

### Random Decoding

Also unlike some encoding schemes, Cryptex does not require that encoding and decoding be done in serial fashion. Records encoded serially can be decoded randomly; encoded and decoded data have equal length, the vendor said.

To thwart attempts to break the code scheme by looking at core dumps of Cryptex logic, the program encodes and decodes portions of itself during execution.

Cryptex requires about 1K bytes of main memory and is available as an object program only for OS, DOS or VS systems for \$750 per installation.

Each user's version is "certified unique," the vendor said from 1037 Warren Parkway, 07666.

## 'RED' Keyed to Frequency Counts

STATE COLLEGE, Pa. — The techniques used by the Random Encipher and Decipher (RED) program to protect confidential information defies frequency analysis, developer Gabrielle Workowski claimed, by creating a coded file of uniformly distributed integers from a file of any alphabetic, numeric or special characters on an IBM 029 keypunch.

The enciphering/deciphering process is controlled by a user-chosen key word, a random number starter and a character set frequency calculation. The program will produce a different enciphered file from the same original file by varying any of these factors, Workowski said.

In a sample provided by the developer/vendor, the results were indeed different, apparently because one deciphering was based on the key word "secret" while the other was keyed to "secrets."

Though reluctant to say anything that might expose the technique RED utilizes, Workowski denied it was either a simple

substitution cipher scheme or a poly-alphabetic substitution such as might be used in military cryptography.

The RED approach is based on the frequency of use of each symbol in a user's file. The user is free to specify these frequencies, to use a utility routine that calculates and reports the actual frequencies or to accept values through a default option.

In a test run on an IBM 370/168 under OS/MVT, RED took approximately 0.05 msec to decipher and approximately 0.11 msec to encipher each character in a 72-character string, Workowski reported. But these times would be largely overlapped with processing of a normal file, she added.

The encipher and decipher routines are written in standard Fortran IV to be applicable on any CPU. They require 6K and 5K of main storage, respectively, and the source decks cost \$250.

Workowski is at 308 Bath St., 16801.



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## System Generation Eased by Planning

(Continued from Page 16)

### STAGE-II job stream.

**HASPNUC** — To relink edit the nucleus created with inclusion of the Hsp resident SVC (necessary for Hsp).

\* Our system was released as a one-volume DL1B01 3330 restore tape and our new SYSRES was a single-volume 3330.

The format of the SYSGEN master deck provided an excellent method for fully documenting the entire SYSGEN procedure. All of the steps were well-defined.

All of the dependencies of values on settings of the standard parameter set were defined. All of the differences between versions of the operating system on each mainframe (or for alternate nuclei) were defined.

In addition, the entire job stream was contained in a single source document and was never modified for the purpose of any single SYSGEN performed.

With the entire job stream fully defined and created, there is only minimal manual intervention in the SYSGEN procedure. Aside from the necessary tape mounts and some initial console intervention, the entire SYSGEN is possible to run on a remote submittal basis.

Although the initial usage was to generate an OS/MT system, there is equal applicability to MFT and VS. The VS study project at our installation has adopted this technique and has encountered no problems.

The next article in this series provides details on the macros and other coding techniques used to implement the basic concepts outlined above.

The authors worked together at the National Bank of Detroit and Alexander is still in the systems group there. Blackford is with Xerox Corp., Rochester, N.Y., and Schuff is now with Coastal States Gas Corp., Houston, Texas.

## Tape Management System Distributed Free to 300 Users

**SANTA CLARA, Calif.** — The Memorex Tape Management System (MTMS) has been requested by more than 300 tape users to date, a Memorex spokesman said recently.

Introduced last year, MTMS is available free to users who agree to purchase a year's supply of tape and disk pack requirements from Memorex.

A series of nine programs which may be adopted modularly, MTMS offers a concise inventory control of tapes, minimizes the risk of scratching a valid tape and flags tapes eligible for release by a choice of various preprogrammed modes of establishing retention periods, the vendor explained.

MTMS is intended for tape libraries ranging in size from 300 to 10,000 reels. It is written in ANS Cobol and is compatible with both OS and DOS operating systems.

The system's tape contains source code ready for a compiler, test data samples (OS) and a 30-page user manual.

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# COMMUNICATIONS

**Good Things Come in Small Packages, Survey Shows**

## Diagnostics, Messages Primary Use of Hand-held Units

By Edith Holmes  
Or the CW staff

NEWTON, Mass. — Users seem generally satisfied with the capabilities of Termiflex Corp.'s hand-held interactive display terminal introduced earlier this year (CW, May 11).

Companies indicated they generally use the device for system diagnostics and message service, according to a recent Computerworld survey.

The terminal "really is a complete plug-compatible Ascl replacement for a teletypewriter," commented Dave Freisen of the First Data Corp. in Waltham, Mass.

But, he added, "the device best suits those who don't need a lot of interaction with their system and who aren't bothered by a small display screen."

In the general time-sharing and software development business, First Data Corp. uses its Termiflex HT/2 for data set testing, Freisen said.

Weighing under two pounds, the terminal, with its teletypewriter-compatible current loop, "is easy to carry around and plugs into customer systems to determine whether faults lie in the terminal system or in the communications line."

He added the terminal's 1,000-character scrolling memory also helps the operator find character errors in any given burst.

### Limitations

While his company plans to continue its use of the terminal in diagnostics, Freisen remarked that for his purposes the unit's biggest drawback is that it "is not a general time-sharing device."

Because most time-sharing applications are written for the Model 33 TTY's 7.2-character line, these would have to be

converted to fit the two-line, 10 char./line display of the hand-held terminal, Freisen explained. While the HT/2 "could certainly handle these jobs," the 20-character screen "would make it impossible hard to read the output," he said.

Applications could be redesigned to fit into a smaller display format, but Freisen speculated the Termiflex device and others like it will probably be used for new applications written to require shorter character lines.

Despite these limitations, he considered the terminal "a clever device" and cited "portability and a full 128-character ASCII keyboard" as its chief advantages.

Gregory Thagard of Lundquist-Thagard Oil Co., based in California, agreed, noting his firm purchased the HT/2 "for its size and flexibility."

But Thagard also echoed the comment that he would like to be able to see more on the display screen.

"Perhaps Termiflex could shrink the size of its characters so the unit could display from 40 to 64 characters at one

time," he suggested. "The ability to view more at once would make comparing lines of figures easier — we wouldn't have to scroll up and down as often."

Relying on interactive time-sharing to run two-thirds of its business, the oil refinery and paper product company uses the terminal "to enable its president to be remote," he explained. By carrying the device with him as he travels, the president can send and receive messages to and from other company officials at the home office and in other locations.

An RS-232C interface allows the terminal to interface with a variety of computer systems and cassette and other recording devices, Thagard noted.

While his company considered building its own small terminal for in-house use and evaluated a similar device soon to be released, Thagard said he selected the HT/2 after working with the unit at the National Computer Conference last May. "We still have the terminal on an evaluation basis, but we're very satisfied with it; it meets management's requirements," he

remarked.

A research and development firm involved in the Arpa network, Bolt, Beranek & Newman in Cambridge, Mass., also plans to use an HT/2 for message service, according to employee Frank Heart. "Unfortunately, we haven't had any on-the-road experience with the terminal yet because we haven't received the acoustic coupler needed to connect it to the network," he said.

But after playing with the device in his building, Heart commented he had "only nice things to say."

As at the First Data Corp., Ed Schoppe of the Foxboro Development Corp. in N. Attleboro, Mass., said his firm hopes to employ the Termiflex terminal as a diagnostic aid.

Intended by the firm for use in diagnosing systems and controls for materials handling in manufacturing operations, the terminal will eventually interface to a PDP-11 via a 20mA current loop, Schoppe explained.

## Interconnect Case May Decide Industry Fate

By Ronald A. Frank

Or the CW staff

QUEBEC CITY — A case now pending before a U.S. appeals court might mean the beginning of the end for the interconnection industry, according to W.H. Borghesani Jr., counsel for the National Retail Merchants Association (NRMA), but such an outcome is not expected.

In a "Washington Telecommunications Report" prepared for delivery at the an-

ual NRMA conference held here recently, Borghesani said, "AT&T and the Bell System are taking full advantage of the political sensitivity on the part of state commissioners and are doing everything possible to by-pass Federal jurisdiction in the interconnect and specialized common carrier areas."

"More than a year ago the North Carolina Utilities Commission, pretending that we have two public switched networks, one for intrastate communications and one for interstate communications, attempted to reverse the Carterfone policy permitting interconnection of customer-owned and maintained equipment used for intrastate communications. As a matter of fact, there is only one public switched network used commonly and indivisibly for interstate and intrastate communications."

This set off quite a furor in the regulatory world and now involves not only the NRMA, but all of the telephone companies, state and federal agencies and just about every other major trade association representing users of telecommunications services and equipment.

In proceeding in which NRMA participated very vigorously to sustain federal jurisdiction and interconnect policy from interfering state regulations, the Federal Communications Commission (FCC) issued a decision last February preempting jurisdiction in the interconnect area, he noted. This meant that interconnect policy is set by the Federal Government. It does not mean that the state regulatory bodies are excluded.

It does, however, mean that the state regulatory bodies may not compromise, curtail or adversely restrict in any way federally made policy with respect to the ability of retailers and other users to purchase and operate private communications equipment be it PBXs, key telephone systems, answering devices, dialers, modems and the like, Borghesani claimed. Immediately after the release of this decision of the FCC, numerous appeals were made to several federal courts, he added.

These appeals have all been consolidated in the Fourth Circuit Court of Appeals in Richmond, Va. The North Carolina Utilities Commission appealed; so did AT&T, the National Association of Regulatory Utility Commissioners and numerous other telephone companies who deemed themselves adversely affected by this assertion of regulatory authority in the interconnect area by the FCC.

Final reply briefs were filed by the opposing parties (NRMA is among the defending parties) in the middle of September. As yet, oral argument has not been scheduled by the Fourth Circuit Court of Appeals, but NRMA anticipates a schedule for the oral argument very shortly, he noted. Thereafter there will probably be a number of months before a decision is issued.

"We think we are going to win and that the federal preemption of jurisdiction with respect to interconnection policy will be sustained under the Communications Act of 1934, the report said.

The report was delivered by Joseph Keller, a law partner of Borghesani.

## Burroughs CRT for On-Line Nets

DETROIT — Burroughs Corp. has announced the availability of a CRT terminal system with a variety of display, keyboard, cassette tape and line printer options for use in on-line networks.

The TD 820 input and display system comes with a display capacity of either 960 or 1,920 characters, the company said. Data is displayed in 12 or 24 80-character lines.

The company noted the terminal can display white characters on a black background as well as black characters on a white background. These methods of display can be mixed so that selected fields of data can be displayed in contrast to one another it explained.

Additional display options are said to permit blinking of a designated character or field and "black video," a technique which allows data such as a security code to be entered but not displayed.

The terminal operates with either an alphanumeric typewriter keyboard or an

alphanumeric keypad keyboard.

A separate 10-key numeric keyboard can be used with either of these, the company added.

For storage of data collected locally or by transmission from a central computer, the company said users could employ up to two magnetic tape cassette stations or up to two minidisks operated in either attended or unattended mode.

Line printers provided for the TD 820 operate at 85, 160- or 250 lines/min.

A magnetic card reader can be incorporated in the terminal system to identify the operator and prevent unauthorized use of the network, the vendor said.

A typical 960-character terminal system has a purchase price of \$6,250 and a one-year lease rate of \$160/mo. The 1,920-character TD 820 costs \$6,800 and leases for \$175/mo on an annual basis.

All versions of the terminal system can be obtained from the company's Business Machines Group, 48232.

## Dispatches Emergency Crews

# Net Gives Utility More Service Power

ALLENTOWN, Pa. — Pennsylvania Power & Light maintains its electrical service with the aid of an internal communications network, which ties all field service offices directly into the utility's two central computers through 78 high-speed terminals.

The terminals, Memorex Model 1242s, are used for dispatching emergency service crews, preparing construction details, assisting customer service representatives in analyzing future power needs and as electronic message and inquiry devices.

The terminals are interfaced to the company's IBM 360/65 and 370/158 computers with a Memorex 1270 terminal control unit with optional code conversion. This feature converts the Ascii code of the terminals to BCD code, allowing standard IBM software to be used, a utility spokesman noted.

The computers' data base is stored on two Memorex Model 3670 disk subsystems, each subsystem having six drives of 106M byte/spindle. The drives are switchable between the utility's two CPUs. Thus, the data base can be shared by both processors.

Field service offices of the utility company are located as far away as 125 miles from the computer center and are scattered throughout the 10,000 square mile service area. "The rapid access to our computer base, as well as improved com-

munications to the line, is identified.

This data is then transmitted through the terminals from the service representative to the appropriate emergency dispatch area where the outage occurred. Under this system, dispatching of emergency crews can be accomplished within six minutes of an outage report.

Soon after arriving on the job site, the emergency service crew's estimate of when power will be restored is communicated to headquarters.

In another application, each of the utility's major storerooms now has a terminal to communicate current information to the inventory data base on stock status, availability, bin locations, pricing, etc.

Engineering personnel can query the data bank regarding current and future material requirements and availability. The CPUs, in turn, generate exploded bills of material, instructions, labor and

material cost estimate requisitions back to the stores.

Under the previous method involving keypunching, requesting computer runs and mailing schedules usually resulted in a four- to seven-day lead time. "Now," Noll related, "distribution of engineering inputs completed by noon produce outputs by 8 a.m. the following day."

"With the terminal's inherent advantage of direct computer access from remote field service centers, our engineering and technical personnel are no longer saddled with enormous paperwork prior to planning equipment installations," Noll said.

A current expansion of the company's communication network will provide remote offices with point-to-point message switching capability. Thus, during an emergency, remote offices can readily provide the central emergency center with information as to status of its crews.

## Remote Terminal Prints 10 Char./Sec

BLUE BELL, Pa. — Designed for low-speed applications, a remote terminal introduced by Univac offers users a teletypewriter-compatible device which prints at 10 char./sec.

Incorporating a data entry keyboard and an incremental printer, the DCT 475 operates in half- or full-duplex mode and prints a 63-character Ascii set in up to 132 print positions.

Transmitting at 110 bit/sec in asynchronous mode, the terminal is available at a price lower than the company's higher speed DCT 500 terminal. The DCT 475 may be leased for \$80/mo, including maintenance, under the firm's standard one-year rental agreement.

The company noted the terminal may also be purchased for \$2,592.

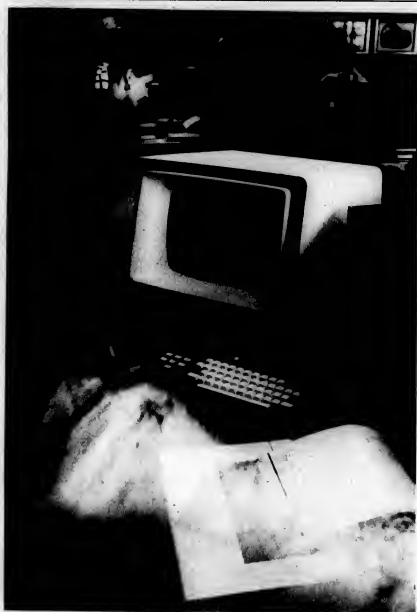
Initial deliveries are scheduled for the fourth quarter of 1974 from P.O. Box 500, 19422.

Pennsylvania Power and Light's Janice Kreuger operates a Memorex communications terminal in the company's central emergency room.

munications between service offices, has given our service representatives a boost in both productivity and the ability to provide efficient service to each customer within the office's individual area," said Clair Noll, manager of systems and programming.

Under the system previously used, data pertaining to incoming customer outage calls was sorted manually in context with large circuit maps hung on the wall. A severe snow storm sweeping the area would produce many hundreds of calls, resulting in inefficiencies in the analysis and dispatching of restoration forces.

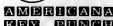
Now calls are automatically distributed to customer service representatives, Noll said. When a call is received, the local service representative accesses the data in Allentown through a CRT terminal. The customer is immediately located in the electrical network, and the transformer, plus applicable protective devices provid-



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## Speeds to 250 Kbit/sec

## Synchronous, Asynchronous Data Mixed

CHATSWORTH, Calif. — A time division multiplexer built to handle synchronous and asynchronous data from terminals, modems and computers for transmission over high-speed networks has been introduced by Micom Systems, Inc. The Micom DDM 40/01 enables a large or small number of synchronous and asynchronous terminals or modems operating at any speed from 50 bit/sec to

## Portacom Prices Reduced

STAMFORD, Conn. — Dataproducts Corp. has reduced the price on its Portacom portable data terminal from \$1,695 to \$1,495, with delivery in 30 days.

The typewriter terminal features an impact printer with an ability to produce multiple copies, a built-in solid-state acoustic coupler and a separate numeric pad on a full ASCII keyboard, according to the firm at 17 Amelia Place, 06904.

64 kbit/sec to be multiplexed over such synchronous data links as digital networks at speeds from 1,200 bit/sec to 250 kbit/sec, the company said.

Able to intermix one or more asynchronous channels with a number of synchronous lines operating at any data rate, the DDM 40/01 is said to enhance the utilization of 4.8-, 9.6-, 19.2- or 56 kbit/sec synchronous digital networks or modems. The multiplexer can also intermix various rates of synchronous lines for transmission over wide-band links. Any data rate up to 250 kbit/sec can be handled by the device, eliminating multiple voice-grade lines and modems, the firm commented.

The firm said the multiplexer's standard features include on-line diagnosis, local and remote alarms, displays and local and remote loop-back controls for each channel and common logic. An optional line

quality-and-status monitor provides displays of local and distant error rates and of system status.

Available in channel configurations ranging from two to over 1,000 channels, the device's modular construction permits field expansion as well as desktop and rack mount installation.

Including all but line interface modules, the basic control unit on the DDM 40/01 costs \$1,000. Synchronous line interfaces sell for \$340 each, and interfaces for asynchronous lines without controls are available for \$300. With controls, these interfaces may be obtained for \$335 from the firm at 20426 Corisco St., 91311.

## Vadk Modem Bell 201B-Compatible

MOUNTAIN VIEW, Calif. — Vadk Corp. has introduced a private-line

## AT&amp;T Planning Private Transaction Telephone

QUEBEC CITY — AT&T's new Transaction Telephone (CW, Oct. 9) will be available in a polled private-line version "within two years," AT&T said. The planned model will include some type of printing capability, according to a Bell spokesman. The statements about the Bell terminal were included in an AT&T presentation at the recent National Retail Merchants Association conference here.

During most of 1975, the Bell terminal will be in short supply and will be available "on an allocation basis" from local phone companies, the spokesman said.

modem that is "fully compatible" with the Bell System 201B data set.

Designated the VA2405G/K series, the modem is said to allow rapid carrier acquisition over worst case lines. The 2,400 bit/sec unit operates over both two-wire and four-wire lines and includes built-in digital and analog loop-back.

Address selection circuits enable the modem to display transmit data, receive data, request to send, clear to send, data set ready and carrier detect signals.

The VA2405G/K can be used in both polled multidrop or point-to-point systems and the device is compatible with standard modem chassis from Vadk. The modem incorporates a differentially phase shift keyed transmitter that accepts serial data that must be synchronous with a transmit clock, the company said.

The modem on a board is \$675 or \$850 with compatible chassis. First deliveries are scheduled for February 1975 from 505 E. Middlefield Road, 94043.

## Numerics Added to ADM-1

ANAHEIM, Calif. — A numeric keyboard from Lear Siegler, Inc. is an optional accessory to its ADM-1 video display terminal.

Oriented in a 10-key calculator matrix with a decimal point and return key for resetting the terminal's cursor, the unit can be operated from either side to accommodate both right- and left-handed users, according to the firm.

Designed for accounting, engineering and other mathematical applications where a 10-key format is desirable, the unit is priced at \$195 from the firm at 714 N. Brookhurst St., 92803.



ADM-1 With Numeric Keyboard

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Washington-Lee is one of several dozen financial institutions in Virginia, Maryland and North Carolina tied into the specialized computer network of Data Systems Corporation.

The Data Systems mainframe is a Burroughs, so Washington-Lee started off with Burroughs TC 700 teller terminals for daily transactions: savings, mortgage loans, Christmas clubs and so on.

Then they added some INCOTERM SPD® 10/20 Intelligent Display terminals to the network. At Washington-Lee, INCOTERM works side-by-side with the TC 700's. The mainframe can't tell them apart.

INCOTERM's job is to process a major portion of Washington-Lee's mail transactions, such as savings, mortgage loans, Christmas clubs and so on. In addition, INCOTERM is used to check on the status of accounts and to enter all alpha information.

Management uses INCOTERM to monitor daily activity in the 13 branches.

The TC 700 does the same jobs. INCOTERM just does them faster. According to Washington-Lee's Data Processing Manager, it prints totals in less than half the time.

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## Terminal System With 65K Based On Micro, CRT

CARSON, Calif. — Two micro-computer-based dispersed data processing terminal systems have been developed by Microtech Data Systems, Inc.

The Model 8/640 incorporates a CRT monitor, a standard typewriter keyboard with a 10-key numeric pad, twin digital cassettes, a processor and memory capacity ranging from 8K to 16K bytes in combinations of read only memory (ROM), programmable read only memory (PROM) or random access memory (RAM). The self-contained unit is designed primarily for OEM users, the firm said.

The Model 8/640 II is also a self-contained unit, but this version of the terminal system is intended for use by distributors and end-users, according to the company.

While the 8/640 II includes features similar to those of the 8/640, the end-user model has a memory range from 8K to 65K bytes in any combination of ROM, PROM or RAM. In addition to twin digital cassettes, the company said, this terminal system will support floppy disks, fixed-head disks, character and line printers, 3M cartridges and 7- or 9-track magnetic tape units.

Both systems use a software package called Microtext, and both are available on a 90-day delivery basis.

The 8/640 sells for \$4,800 and the 8/640 II for \$5,700 from the firm at 1141 E. Janis St., 90746.

## BR Package Ties MDS/7 Terminals to IBM CPUs

TRUMBULL, Conn. — A "second port" software package developed by Bunker Ramo Corp. enables brokerage offices to use their Market Decision System 7 (MDS/7) quotation service terminals for I/O access to in-house IBM CPUs.

Tying the MDS/7 control unit to the CPU through a normal front-end channel, the emulation software allows the unit to respond in a fashion identical to IBM 3270 control unit at remote locations, the company said.

In addition to the \$600 to \$700 monthly charge for the Bunker Ramo quotation service, control unit access to the CPU costs \$60/mo plus \$30 for each terminal activated.

The firm is located at 35 Nutmeg Drive, 06609.

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- Tape cassette feature for local data collection

## Key-to-Disk Data Entry Solves Operational Problems

McDonagh said the marriage has worked out very well for Cyberco on the school scheduling project and others, too. During the day, operators enter data at the keystations. The CMC 5 system auto-

## Modcomp Adds 32K-Word Core Board, Net Software

A direct result of the development of the 32K word memory module was the announcement of six Modcomp 16-bit

This includes training new operators.

The II/231, priced at \$27,500, contains, in addition to all of the II/26CP features, a peripheral control interface enclosure, direct memory processor, multiplexer con-

Hardware requirements to utilize Maxnet III are a host computer (consisting of Modcomp II computer with at least 32K words of memory, a disk and a console device and a communications link to each satellite) and one or more satellite computers (each satellite consisting of a Modcomp II computer with at least 24K words of memory and the communications link from the host system).

Modcomp is at 1650 W. McNab Road, 13700.

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## Company Not Losing Its Shirts As System Keeps Track of Orders

NEW YORK — The once-stable shirt manufacturing industry has changed radically over the last few years and management today must scramble to predict fashions, forecast sales and assemble the right materials in time.

"Without the information produced by our computer," said Marvin Kahn, president of Kayser-Roth Corp.'s Excello Division, "it would be impossible to be blind in the marketplace with no way of gaining an accurate handle on the business."

"Today, style is in constant change and the stripes that were popular last year can change overnight to plaids or checks, so the market belongs to the company that can respond rapidly to change," Gabriel Chekow, Excello's controller, added.

Excello's computer is a Univac 9400 system with a main storage capacity of 98K, four magnetic disk units storing all the file data and two magnetic tape units used mainly for backup storage but also for keeping information for booking analysis and sales statistics.

A Univac 1005 card-processing system, which was in use by the company before the 9400's installation in 1972, now serves as the input/output unit to the 9400, performing card reading and printing functions.

One of the major tasks for the system is order entry. Orders taken by Excello salesmen are mailed to York, where they are keypunched, entered into the system and edited. This stage consists of comparing the order against a set of parameters programmed into the 9400 (Is the price correct? Is it a valid style? Is the order identified with the proper salesman? Is the packing correct? Is the scale right?). The computer also checks the customer's credit from the standpoint of the particular order being processed and considers any other orders for the same customer in various stages of delivery. Another criteria for acceptance of the order is raw material availability.

A validation report is produced from the orders which tells if the order was booked or rejected. If the order is accepted various reports are generated for the sales and manufacturing departments and statistical reports are prepared, broken down by customer, region, salesman and product (category and style).

### Generates Reports

Top management in New York receives daily, weekly and quarterly reports on all aspects of sales activities. Perhaps the most important of these is the Management Action Report.

Prepared every Friday, the report compares sales-to-date by product category and style with forecasts for these products made prior to the opening of the season. Also shown are the quantities of piece goods ordered and on hand for each category and style. In addition, the report shows the delivery schedules by month for the various styles so that shipping requirements in the immediate months can be forecast.

### Prediction Aid

Both sales forecasting and predicting fashion will be helped by the accumulated data reflecting trends throughout the nation, Chekow observed.

Although Excello maintains inventories of the most popular styles, the company primarily manufactures to cover customers' orders and projected sales. Buyers must continually readjust their orders for piece goods from the report so that adequate material will be available to produce finished goods until the end of the season.

"We are moving towards the stage when we can project basically by category what the demand will be for a particular style at some future date," he added.

From the Management Action Report, a number of other reports are created. A

Piece Goods Report is produced weekly which shows all purchase orders issued for piece goods, receipts of piece goods at any of the factories by case number and any deductions from piece goods inventory caused by their use in making finished goods.

The Inventory Status Report, a weekly report for the customer services department, shows inventories of finished goods by cut number, by size, orders allocated to specific customers, delivery dates, quantities still to be cut and uncommitted stock on hand.

When finished goods arrive from any of the factories into the York distribution center, cards reflecting these entries to stock are punched and entered into the computer. This triggers an automatic suggested allocation of the stock to meet customer orders in hand.



Orders for Excello shirts are sent to the York, Pa. facility, where they are keypunched and entered into a Univac 9400 system.

Excello doesn't follow the computer's suggestions automatically. After the computer had made its allocations, product workers who are familiar with the trade "second guess" the system's judgments. Most of the computer's allocations are satisfactory, but when the workers find an obvious error they correct it.

"The computerized assistance in allocation," Chekow noted, "has been a great help in what used to be a horrendous job of manually going through card index files to match stock to customer needs. But the beauty of our plan is that we can still 'fine-tune' it manually to optimize our allocations."

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## At San Diego Gas & Electric

# Improved Customer Service Goal of On-Line System

By Nancy French

Of the CW Staff

SAN DIEGO, Calif. — A customer who wants to complain about his electric bill, change his address or hook up a new gas stove now can alert everybody at San Diego Gas & Electric Co. who needs to know with a single call.

San Diego Gas & Electric's objective in going on-line was better customer service and, understandably, 75% of the company's terminals are now devoted to customer service.

Customer inquiries and service account for 80% of daily terminal transactions.

The system is built around IBM 370/145, one with 768K and the other with 512K. Disk storage to support both on-line and batch requirements of 1.6 million bytes includes a mix of IBM 3380 disk drives. The IBM units are presently being upgraded to Model 11 200M byte/

spindle capacity.

Peripheral equipment includes 11 tape drives, two printers, a 1287 scanner, Computer Machinery Corp. key-to-disk system and Quantar computer output microfilm equipment.

San Diego Gas & Electric has 60 CRT terminals of which 54 are Sanders 720s. An IBM system was chosen, according to Tom Ila, data systems supervisor, because "historically we've been an IBM shop. Our first computer was an IBM 650 as far back as 1959 when we first converted to computerized billing. Then we moved up to the IBM 1401, 1410 and then we were up into the 360s—a 360/30, then a 40, then a 50. Now we're using 370s.

"IBM was chosen because of their overall compatibility with our needs. We found that the cost/performance put IBM in a very positive light," he explained.

But for terminals, San Diego Gas & Electric chose Sanders.

"We got our first terminals in early 1970, and they were IBM 2260s. We found out they weren't as flexible as what we were looking for, and eventually we chose the Sanders. These also come out with a very strong cost/performance," Ila said.

### Methodical Transition

"Our transition to the IBM system was a very long-term methodical plan," Ila explained.

Goals and objectives were defined in 1969.

For customers, the company wanted improved service — faster access to customer records.

For information, consolidation by application was the goal.

As for growth, the company wanted to

build in the ability to handle increasing clerical volume with a minimum impact on personnel.

Concerned with the need for accuracy, the company wanted the ability to catch errors at their source.

"We came on-line with the basic inquiry system in 1970. At that time, we had the ability to display each account on the screen by keying in the account number.

"Then, about a year later, we added the ability to find the account if we had the customer's address.

"Finally, we added the ability to get the account by keying in the meter number," he added.

Terminal data entry began its pilot phase in 1972. The utility was "pretty well full on-line" in 1973, according to Ila.

The system also maintains inventory control for 17 individual warehouses throughout the service area. Material issues and receipts of each warehouse are updated nightly and are available to the material control terminal operator the following morning.

As for management information, an integrated cost reporting system allows access via CRT to the status of various company cost centers. Budget and actual costs can be viewed on a month-to-date or year-to-date basis, Ila said.

Summary costs on any company construction project, showing all charges to date, can be quickly accessed.

## Terminal Modifies Punch Tape Programs

CONCORD, Calif. — An editing terminal from Zehntel, Inc. is said to allow rapid creation and modification of punched tape programs.

The Model 760 CRT/Punched Tape Editing Terminal was developed to complement the company's existing line of automated test systems but may be adapted to create and edit programs for other punched tape-loaded or tape-operated automatic systems, according to the vendor.

A keyboard/CRT terminal displays as many as 24 lines of up to 80 characters each as a "page." The page is stored in high-speed semiconductor memory which can be modified by keyboard entries, the vendor said.

Once the page is edited, it may be punched out on a 75 char./sec. punch capable of creating mylar tapes. In addition, an optional line printer may be operated in parallel for hard copy print-out.

Programs to be modified are entered through a 300 char./sec. reader.

A flexible data bus interface with a microprocessor controller provides expansion capability to add interfaces for other peripheral devices later so programs can be converted from punched tape to disk or other magnetic media, the firm said.

Price of a 760 system complete with punch and reader is \$12,475; the line printer option is an additional \$2,800 from the firm at 2440 Stanwell Drive, 94520.

### Impact Printer Available

HUDSON, N.H. — The Model 102AL 132-column serial impact printer from Centronics Data Computer Corp. has a printing speed of 330 char./sec and 125 lines/min.

The printer generates characters in a 9 by 7 dot matrix pattern. Popular computer and communications (up to 9,600 bit/sec) interfaces are available.

Various foreign and other character sets, including upper and lower case, are optional.

The Model 102AL costs \$4,675 from the vendor at One Wall St., 03051.

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## Three NCR Forms Handlers Decollate, Burst, Imprint

DAYTON, Ohio — NCR has introduced three forms-handling devices: the 530 decollator, the 531 burster and the 532 imprinter.

The two-speed 531 burster is designed for medium- and short-run bursting of continuous forms. It has the ability to decollate a portion of a multiple-part bond and carbon form while at the same time bursting other parts, the company said.

It can also trim margins, decollate, burst and restack single and multiparty continuous forms sequentially in a one-pass operation.

The variable-speed 530 decollator, which handles carbonless paper forms as well as carbon-interleaved forms, can accommodate a wide variety of forms sizes and types, NCR said. In a single-pass operation, two parts are separated, a carbon is removed and the forms are neatly refolded at variable speeds up to 300 f/min.

The portable 532 imprinter, which can sign up to 75 checks per minute, can also be used to imprint invoicing explanations, remittance locations and advertising messages on 3-1/2 in. or 7 in. continuous documents.

The compact design permits the control desired in many check-signing operations and allows the storage of the complete unit when extra security is needed. Signature plates are easily removed for secure storage, the company added. The 530 decollator is priced at \$549; the 531 burster at \$2,345 and the 532 imprinter at \$425.

## Stand-Alone Printer Priced at \$1,195

CHICAGO — A \$1,195 alphanumeric stand-alone printer is available from Victor Comptometer Corp.

The 5010 data terminal prints 34-character lines at 110 char./sec or 90 to 240 lines/min depending on line length, according to the vendor.

The printer uses the same case and printing mechanism already developed for Victor's calculator line, and the vendor predicted some of the key applications will be as receive-only terminals, output devices for microcomputers, general data logging and communications.

There are no moving parts when the unit is idle; the motor runs only during printing to reduce wear and to insure minimum maintenance.

Double line buffering permits a new print line to be received as the previous one is printed. An elongated character mode permits lines of up to 17 characters to be printed at double width.

The 7-wide printing head forms the 64 Ascii alphanumeric and symbolic characters on a 5 by 7 matrix. Lines are printed in two colors on standard 3-3/4-in. adding machine paper.

Other than the standard parallel Ascii interface, two serial interfaces, ITTY-current loop or RS-232C, are optional. The firm is at 3900 N. Rockwell St., 60618.

### Calcomp Hikes Tape Library Prices

ANAHEIM, Calif. — California Computer Products, Inc. (Calcomp) has increased purchase and lease prices of its mass storage systems, the automated tape library, by 15% and 8% respectively. The increases include basic maintenance.

The Calcomp mass storage system stores and automatically selects, mounts and dismounts reels of magnetic tape on IBM 360 and 370 computers.

The system is manufactured by a Calcomp subsidiary, the Xytex Corp., Boulder, Colo.



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## Like a Jigsaw Puzzle

### Program Disassembles, Reshapes Globe

By William A. Scholes  
Special to Computerworld  
CANBERRA, Australia—The Department of Geology at the Australian National University has developed a computer program to put the continents of the world into shape—and not just one shape.

The program, believed to be one of the most advanced of its type, allows reconstruction of the globe to test theories of the earth's development. The continents can be rapidly pieced together and taken apart like a jigsaw puzzle but without having to do it manually.

The computer program, *Plots of Continental Outlines* (Cnplot), consists of feeding masses of digitized data on the positions (latitude and longitude) of the continents on the globe into the university's Univac 1108 computer.

Other information, such as magnetic pole positions for each continent for different geological epochs, sea floor magnetic data and age determinations of rocks and various other geological features of the world, has been codified and fed into the program.

From the data, the computer can be asked to print out any

reconstruction of the continents, making the globe assume the form it may have had at any stage of its history.

#### Repositioning Continents

The computer can, if required, quickly draw the globe with the present north pole's position on the equator. By this reversal of the likely continental drift movements, Australia is as a brought closer to the equator.

This repositioning is confirmed by the fact that traces of Devonian coal reefs, 370 million years old, have been found in Greenland and Australia.

Most maps project the world onto a cylinder. The computer program can plot various projections for different purposes and can avoid such distortions. It is also possible to change the angle of view by changing the center of projection to any convenient position.

The Univac 1108 program was developed by a research assistant in the Department of Geology and is being extended as new computing techniques and geological data become available.

The Geology Department is presently equipped with remote terminal access to the computer,

which is in the university library. The program was developed to assist with a continuing project of tectonic research being carried out by Dr. Mike Rickard, senior lecturer in geology. Part of this work consists of testing different global reconstructions by plotting various geological paleomagnetic and paleogeographic data.

#### Analyze Deformations

Earlier work, from which the idea for the present program arose, was started by a former Ph.D. student in geology who developed a program for plotting and moving continents for statistical procedures to analyze geometric patterns of deformation features of the continents and oceans.

Another university staffer is also using the program to examine the break-up and reassembly history of Australia, Antarctica and New Zealand.

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## 'Latest Thing' in Infant Pacifiers May Diagnose Learning Disabilities

MIAMI—The latest thing in pacifiers is a computerized nipple being used at the University of Miami to diagnose possible learning disabilities and brain damage in newborn babies.

Invented by Dr. Thomas P. Shriner of the school's Mallman Center for Child Development,

### Learning While Doing

EAST LYME, Conn.—Inmates in a keypunch program at Niantic Correctional Center for Women are now processing all medical bills for the state welfare department in an effort to speed up payment and save the taxpayers money.

The department has started sending all of its 20,000 drug bills a week to Niantic, 12,000 more than it previously sent. Inmates who process the bills are paid between \$20 and \$40 per week.

There are 20 women enrolled in the program at present, and another six or seven involved in classroom training. Corrections Commissioner John R. Manson claims that the program is successful because it gives the women a chance to learn a skill in preparation for their release and to earn money at the same time.

the nipple could become a reliable hearing-and-learning test for infants as young as one or two days.

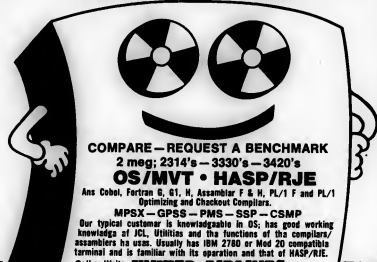
#### Tuned In

The device begins operating when an infant sucks on a rubber nipple attached by a tube to a computer that records the frequency of the baby's sucking. The system, in turn, is linked to a loudspeaker that plays either pleasing or irritating sounds; the harder the infant sucks, the louder the sounds become.

Shriner found that when pleasant sounds are played, the infant sucks harder; when unpleasant sounds come over the loudspeaker, the baby sucks less. Shriner has determined with this device that even a two-day old can discriminate between sounds. He believes the keenness of this ability may be an indicator of the infant's IQ, end slow or indifferent responses might signal a development problem in the brain or nervous system.

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# System Bests Newark Firemen's Water Problem

By Joseph M. Redden  
Special to Computerworld

NEWARK, N.J. — Firemen have a recurring nightmare — rushing to a fire, hooking their hose to a hydrant and finding no water comes out. Unfortunately, it's not just a nightmare. It happens. And it's not just embarrassing — it can be tragic.

The Newark Fire Department once had this problem. We were able to respond quickly to an alarm, but a lot of things could go wrong once we got to the scene and many of these have to do with water supply.

In the summer of 1973, for example, we had a big fire in Newark which spread through a whole block of frame buildings before we got it under control. We just couldn't get enough water to our pumps. We found out later that there were available hydrants with larger water capacities a few blocks away.

That made us decide that somehow we had to find a way to relay better hydrant information to fire companies responding to alarms.

We discussed our problem with IBM representatives and, in September 1973, six months after we started, we had the problem licked by putting a data base into the City of Newark's IBM 370/145 computer and installing a 2741 type-writer-printout terminal in our communications center.

We can now radio up-to-the-minute information to officers responding to an alarm about hydrants which are near the alarm box, their availability and the size water main they are on.

The alarm rings in our rather antique communications center (we have DP ideas for this too), sounding out the number of the fire alarm box by the number of gongs rung. The operator immediately types out the number on the IBM terminal, which prints out the needed information.

Since water is our first tool and time is our worst enemy, probably the best way a fire department can improve its service to a community is by trimming the time it takes to get water on a fire. We feel the system now allows us to give better and quicker service with less equipment and fewer men.

## Another Plus

Being able to find water beyond the four hydrants surrounding the alarm box is also a big plus. The first hydrant status

report, in response to the original alarm, gives the nearest box in each direction. Entering these box numbers into the computer gives four more hydrants for each box location. As fires spread, requiring additional companies which in turn need additional hydrants, we can "walk"

right across the city, from box to box, finding more hydrants.

An additional help to us is that we are able to use other city files. We now have access to the city assessor's computerized file, so we can learn immediately the name and address of the owner of a

building which has had a fire.

We are now working on a more ambitious computer program called Fire Emergency Equipment Dispatch System (Feeds). As with the hydrant status system, the fire alarm box location will be the key to the system.

Feeds will provide the dispatcher with a report on the status of all equipment and command personnel. It will also give a priority ordering of all available equipment — for the particular locations and the order in which available companies should be sent as more companies are needed.

When a company leaves its firehouse, Feeds will be automatically updated. And the officer in charge will have a lot more information before he gets to the fire: what companies are responding, how many men will be there and information on the construction of the burning building itself.

Redden is chief of the Newark Fire Department.



Computer information relayed to these firemen before they left their Newark station house told them which hydrants were closest to the fire box, which were operating and which were on the biggest water mains.

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The course will also cover general data communications topics, including intelligent terminals (performance and selection criteria), network software handlers (e.g. CICS) and network organization and design. And, you'll learn about saving money using such innovative concepts as split-stream modems, remote multiplexers/concentrators, diagnostics for fault isolation and front-end processors.

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This seminar runs two days, and total cost, including workbook, reference materials, luncheons and continental breakfasts is \$350. Additional registrants from the same company qualify for a reduced rate of \$300. Current schedule is as follows:

|             |                                |                 |
|-------------|--------------------------------|-----------------|
| Miami       | Miami Marriott                 | December 2 - 3  |
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You should attend this seminar if you are involved in the purchase of EDP equipment or services, whether as a corporate counsel, contract administrator, DP manager, consultant or officer of a using firm.

Cost for the entire 2½ day seminar, including complete resource notebook, continental breakfasts, luncheons and coffee breaks is \$295.00. The current schedule:

|             |                                |                 |
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This course runs for 3 days, and costs \$350, including course materials, continental breakfasts and luncheons. Additional registrants from the same company qualify for a reduced rate of \$300. Current schedule:

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Cost of the workshop, including resource notebook and lunch is \$135. Current schedule:

|        |                 |               |
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NOTE: If time is short, you may reserve space at any seminar by calling collect. Call Maria Hewett at (617) 965-5800.

# COMPUTER INDUSTRY

## CI Notes

### Memorex Adds Memories

**SANTA CLARA, Calif.**—In a move to expand its peripheral product line, Memorex Corp. has reached preliminary agreement to market and maintain Advanced Memory Systems' (AMS) semiconductor add-on memories for IBM users.

Memorex anticipates offering a selected range of AMS units for end users under its own name and will cooperate with AMS in development of future memory products.

Shipments of AMS memory systems sold by Memorex are scheduled to begin early next year, according to Robert C. Wilson, Memorex chief executive.

### MTI Sues IBM

**BOSTON**—Add Memory Technology, Inc. (MTI) to the list of firms filing antitrust suits against IBM.

The suit filed by MTI, maker of add-on memories, seeks \$168 million in treble damages. MTI has charged IBM with monopolistic practices such as changing memory interfaces and manipulating pricing structures.

An IBM spokesman said the firm reserves comment until it has seen the complaint.

### Litton Moves Minis to Sweda

**BEVERLY HILLS, Calif.**—Litton Industries has merged its Litton ABS Division into its Sweda International and Kimball Systems divisions.

The move of ABS minicomputer operations into the Sweda section is expected to aid in "the application of Sweda electronic point-of-sale systems beyond the basic sales data collection and processing functions," said Fred O'Green, Litton president.

## Supershorts

**Holiday Inns, Inc.'s Commercial Systems group** has been named a distributor of RCA's Dataway systems, which are designed to automate many routine functions of hotels/motels and hospitals.

**Computer Transceiver Systems, Inc.** has appointed Western Union Telegraph Co. to perform field maintenance and customer repair on its Execuprot terminals.

**Goodyear Aerospace Corp.** has appointed Integrated Computer Systems AB as Scandinavia area marketing representative for Staran, an associative processor computer.

**Diablo Systems, Inc.** has delivered its 10,000th Hytype I serial printer. The recipient was Data Terminal & Communications, Inc., which uses the printer in its DTC 300 communication terminal.

## In U.S., Europe

# Reports Peg Growth of Small Business DP

By a CW Staff Writer

**NEW YORK**—Total annual sales in the U.S. small business computer market will reach \$1.5 billion by 1977 and \$2 billion by 1983, according to a recent report by Frost & Sullivan, Inc.

Sales of systems, software and peripherals in the U.S. small business computer market for the next 10 years will exceed \$16.5 billion, the report predicted, with the current installed base of 75,000 systems growing to 400,000 by 1983.

U.S. sales for 1973 were \$1 billion, the report said, while total equipment deliveries of small business computers to European markets were set at \$1.8 billion.

"Values [in Europe] are expected to grow at an average compound annual rate of rather more than 15%, which implies an overall increase of almost four and a half times from the 1974 to 1983 period," Frost & Sullivan noted in another report on the European small business computer market.

Because of the divergence in classification between the U.S. and Europe, it is difficult to compare specific system classes in terms of market percentage.

U.S. designations include accounting computer (under \$20,000), small business computers (\$20,000 to \$40,000) and gen-

eral-purpose small business systems (\$40,000 to \$100,000).

Europe, on the other hand, uses six different designations: basic business systems (\$6,000 to \$12,000), visible record computers (\$15,000 to \$60,000), keyboard-oriented disk-based systems, general-purpose computers (\$50,000 to \$450,000), minicomputer-based business systems (\$70,000 to \$250,000) and intelligent terminal systems for business applications (\$20,000 to \$60,000).

### U.S. Market

Accounting computers show an annual sales of \$125 million in the U.S. According to the report, this field is dominated by Burroughs, NCR and Litton, in that order.

The market for these systems will exceed \$150 million in annual sales by 1977 and exceed \$200 million by 1980, with over \$2 billion in sales over the next 10 years, Frost & Sullivan predicted.

The middle range of small business computers, \$20,000 to \$40,000, should grow from its present \$40 million annual sales to over \$150 million by 1977 and account for over \$1.6 billion in sales over the next 10 years, the report said.

Basic/Four, Digital Equipment Corp., Burroughs and Qantel are the main com-

puters in this market, IBM, however, is expected to dominate with the introduction of its System/2, which will likely push the others into developing lower-priced systems, the report said.

The final U.S. category, general-purpose small business computers, represents the largest market in terms of sales dollars—\$7 billion over the next 10 years and annual sales of \$700 million.

### And In Europe . . .

Frost & Sullivan anticipates "well above average" growth rates in Europe through the mid-1970s, with shipments passing \$2 billion in 1977 and \$3 billion in 1979. Market expansions will slacken somewhat after that, but annual delivery values of \$4 billion in 1981 and \$5 billion in 1983 are expected.

Total shipments over the ten-year period will exceed \$30 billion.

Over 1,000 basic shipment systems, valued at \$83 million were delivered in 1973. A total of 285,000 are expected to be shipped over the 10-year period with a value of \$20 billion.

Visible record computers (VRC) have gained in popularity for several years, with some 7,500 systems shipped in 1973 alone, the report said.

"By 1978 the \$0.5 billion per annum shipment level will be reached with 18,000 systems, and in 1983 deliveries will amount to \$723 million consisting of 25,000 systems," the report indicated.

"Over the 10-year period some \$5.29 billion worth of equipment will be supplied, made up of 173,000 systems."

Shipments of keyboard-oriented disk-based systems in 1973 are estimated at 700 systems or \$4.3 million.

Frost & Sullivan forecast substantial expansion in this sector throughout the 1974-1983 period. By 1983 annual deliveries are likely to surpass those for VRC equipment, with \$3.79 billion worth of equipment installed over the 10-year period, or 55,000 units.

General-purpose computer systems comprise over 65% of the European small business systems market, the report stated, with 5,000 units delivered in 1973 at a total value of \$773.5 million. This percentage will decline, although general purpose systems will still account for \$16.18 billion over 10 years—or about 54% of the small business market.

The report predicted annual shipments of \$1 billion or 6,800 systems in 1976 and \$2.73 billion or 18,000 systems in 1983 for small general-purpose machines.

Minicomputer-based business systems are offered by a limited number of manufacturers and therefore account for 1973 deliveries of only 80 systems. But, with competition as the market matures, the study noted, it could double annually for several years reaching \$322.7 million in shipments during 1983.

## Slow Start in POS Installations Seen Picking Up Speed in 1975

By Tom Wiseman  
OF THE CW Staff

**QUEBEC CITY**—Five years after the introduction of automated point-of-sale (POS) equipment, less than 5% of the cash registers in use are electronic. Only in 1975 will shipments of POS equipment exceed 30% of total industry shipments.

These remarks were made during the keynote address by Joseph P. Francini, vice-president of Litton Industries, at the 16th annual National Retail Merchants Association (NRMA) conference held here recently.

"How come we are faced with this slow start-up in retailing and particularly in the general field?" he asked.

"If we look at the current activities with POS in the supermarket and at the impact of the initial installations, we see a more uniform picture, a picture which indicates that POS applications in the supermarket/drug field will reach stability in a much shorter period of time."

Looking back over the past years, Francini attributed part of the problem to retailers and suppliers who were looking for the "impossible dream": the total retail loop—or cycle—or system."

Early promises exceeded the level of information digestible, exceeded terminal application capabilities and even, he suggested, in some cases exceeded customer requirements in areas where existing systems were still quite viable.

### Significant Problems

There were, of course, the usual bugs of new electronics and technology, but the most significant problems were "the lack of systems capable of utilizing the information suddenly available, antiquated approaches to POS, improper priorities and overly enthusiastic expectations," Francini said.

After initial installations, the emphasis on total systems began to show and more pragmatic priorities emerged. But then the pendulum swung the other way.

It is only today, in terms of applications, that retailers are ready to start going back toward the total system, toward "closing the loop," he said. The next generation of POS equipment will be totally programmable machines with a capability for dynamic distribution of intelligence within the system, Francini predicted.

## Mixed vendor systems are bread and butter to a good service company. We're good. And we're hungry.

We're in the single-source computer service business. That means we're in the mixed vendor system service business. We like it that way. But it means working with different combinations . . . a lot of System 360 and 370 mainframes and a long list of plug compatible hardware. That's why we've built a world-wide staff of experienced service pros—one who already know 360 and 370 service and maintenance and know how to handle other mainframes and peripherals as well.

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And we're hungry. For the full story, call Mike Salter, Commercial Marketing Manager at Raytheon Service Company, 12 Second Avenue, Burlington, Mass. 01803. (617) 272-9300.

**RAYTHEON**

# Micros May Find Future Home in Factory Applications

By Molly Upton  
of the CW Staff

**BOSTON**—Microcomputers may well become as common in the manufacturing operations of the future as relays and valves are today, noted D.A. Cassell of

Control Logic, Inc.

To have microcomputers "really proliferate in a wide variety of applications in the same manufacturing facility, we will need such things as virtual plug-in modularity, standardized I/O packages

and parameterized software modules that can be quickly combined to perform a variety of manufacturing control functions," he said.

Addressing a session on "Manufacturing Trends and Technology" at a recent Northeast Electronics Research and Engineering Meeting, Cassell said a very useful development would be a means of packaging a CPU, a 4K- or 8K-byte memory and several channels in analog-to-digital and digital-to-analog conversion in a shape small enough to mount directly on a machine tool head.

These microcomputers would have to be able to withstand the extremes of temperature, shock and vibration that some manufactured parts must withstand, he noted.

"Then we could have 'smart' tool heads for adaptive control and automatic tool changing and 'smart' motors."

These motors would be "given direct orders in the form of next positions or

the parameters of the curve that is to be traced out—interpolation logic would be in the motor itself," he added.

Manufacturing floor managers would be able to carry the computer with them, with a hand-held terminal.

Charge-couple devices "may someday develop into very useful optical scanning devices that will enable the computer to view the surrounding area and the parts being handled and manufactured."

## Small 2M-Byte Memories

"They may also become the basis for mass memories—the equivalent of a 2M byte 'rotating' memory that can be held in the palm of the hand is not beyond the realm of fairly early realization," he forecast.

Cassell envisions the eventual production of computers so inexpensive that they could be thrown away after they have been used for a short time, which would satisfy reliability and environmental immunity considerations.

## User Panel on Service Bureaus Gives Tips to Systems Vendors

**NEW YORK**—A panel of users detailing their experiences with service bureaus also gave some tips to vendors on what might influence them to switch bureaus or go to an in-house system.

During a recent workshop here, the panel unanimously indicated it didn't believe salesmen who said an in-house system could handle their current DP needs for less cost.

Voicing criticism of small systems salesmen, the panel said they often neglected to tell the user what to expect regarding long-term operating costs and to outline possible conversion problems.

Salesmen should convince the customer there will be trouble, and they should also demonstrate a thorough understanding of the user's lingo and needs, said attorney Sy Bossert of Paul Weiss, Rifkin, Wharton and Garrison.

Bossert indicated his firm is not prepared to take on the concerns of operating an in-house system, finding operators paying them fringe benefits and probably developing a DP staff of more than one person.

However, the law firm is installing Sycor terminals which Bossert expects will result in considerable savings on the monthly keypunch bill from the service bureau.

## Patience and Efficiency

Lionel Marcus explained garment-maker Charles Rabin, Inc.'s conversion to a service bureau occurred primarily because of the bureau's patience and efficiency, which lessened the impact of conversion problems and convinced management the system was the right one for that company.

During Rabin's conversion to an accounts receivable system, the resistance to change was overcome gradually. Because of the novelty of dealing with code numbers instead of customers' names, clerks frequently misposted invoices, resulting in the issuance of dunning letters to persons who owned nothing, and new accounts were sometimes asked, Marcus said. But these problems have been solved, he added.

Rabin uses a package offered by the bureau without modifications, so there are some compromises that had to be made. Marcus said the accounts are up-to-date only on a monthly basis, and the report does not indicate the number of days an account is past due.

But he said he didn't feel switching bureaus would be advisable now, since the system is up and running so well.

## Learned Self-Control

Arthur Samuels, director of systems at Kings County Hospital, recounted some of the criteria and pitfalls he had encountered using service bureaus.

Samuels learned to use self-control when asking for one-time jobs from the service bureau. He explained that at first he did not associate costs with what he was requesting, but after being "tickled and dimed," he learned that convenience did have its costs.

"We were like kids in a candy shop," he recalled.

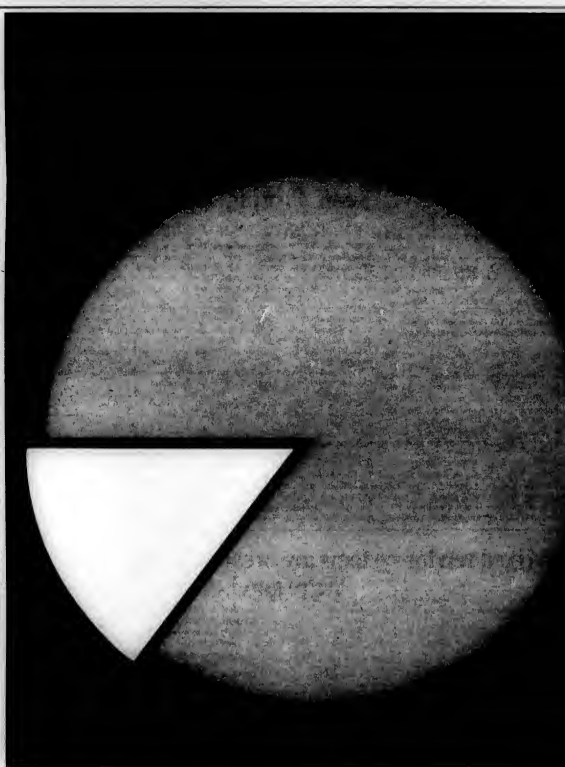
A "type of catch-all that's not explained" is the risk the user takes of being locked into a particular company, making change difficult, Samuels said.

He suggested that, when asking for a project assessment, the user demand a

"nitty gritty, how-to-do-it" study rather than a general study.

Project control can be a problem when working both with an in-house staff and a service bureau, he noted. Some service bureaus won't provide checkpoints.

In addition, in more extensive systems, not everything is covered at the outset, and the user can find himself facing unanticipated charges with the reply that he hadn't asked for that.

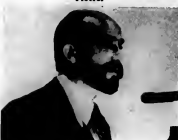


## In Personnel Management

## Executives Advised to Stick to Basics



Pfeffer



Licht

By Mully Upton  
OF THE CW Staff

NEW YORK — "Stick to the basics," "hire the whole man" and "quality attracts quality" was the advice given attendees at the Association of Data Processing Service Organizations (Adapso) recent conference.

In a session entitled The Development of Sales, Technical and Management Personnel, Murray Pfeffer, executive vice-president of Informative Computer Services Ltd., recommended executives get away from the "mom and pop" philosophy and develop a sales organization, stressing the basics for sales personnel.

The first step is to carefully assess whether the marketing manager has had managerial experience hiring, firing or motivating people. Once sure the right man is at the top, hiring should involve

knowing what type of man is needed for the chosen product's marketplace, checking out his honesty, his resume and testing him.

Pfeffer said his firm uses an outside group to perform personality and intelligence tests. The applicant needs sufficient intelligence for the product, he said, but added that too much intelligence might take away from his street-fighting characteristics.

Charlie Licht, president of Advanced Computer Techniques Corp., explained his philosophy of hiring "whole men" for technical jobs by pointing out that if this is done, new corporate management could come from the systems analyst/programmer area.

Whole men, he said, should be preoccupied with technical matters, politics or interorganizational functions, as well as

psychological matters or intraorganizational functions, he said.

DP is brought into a company to be the so-called implanted to regenerate it, he added. In hiring systems analysts/programmers Licht asks: "Do I like him/her?" "Is my like a perversion — is he going to be liked by other people in the company?"

He looks for intelligence . . . There's no substitute for a smart head."

A sense of humor is not only valuable, but necessary. These people face incredible failure on a day to day basis. Throwing bodies against the CPU and getting exasperated out. If a guy isn't cool he's going to crack up."

Licht looks last for competency. "You can train him if he's got all the other attributes," he said.

For training, he suggested hiring a teacher who's done what he's teaching, and then make each student bring to class a real problem required by his company, so the student's company can see some concrete benefit to education programs.

He explained the jobs of systems analyst and programmer are not segmentable. "If you have a systems analyst/programmer, he is doing all these tasks or else you're losing money on him."

The nature of operations requires humans who react like musicians, quickly and almost instinctively. They are "normally underpaid, screwed by management and change jobs frequently."

Licht drew the analogy of operations personnel to 747 pilots, and stated if it was reasonable to expect a 747 pilot to be paid between \$7,000 and \$14,000 a year to monitor millions of dollars worth of investment and equipment.

Bill Edwards, president of American Data Services, explained his firm's philosophy of management, which encompasses all personnel.

Good management is not expensive; poor management is very expensive, he said. There isn't any company any size that can't afford to develop a management team.

He advised attendees to beware of the manager who protects his position. He said to try to attract good people and give them an opportunity to grow, through outside education, internal job switching and sharing with employees both management's philosophy and the rewards.

Management should conduct regular employee interviews on all levels, using the meeting to get them to contribute ideas, as well as guide and motivate them.

## CSC Picks Up Contract For GSA Office System

CW West Coast Bureau  
LOS ANGELES — Computer Sciences Corp. (CSC) has picked up a \$1.3 million contract from the General Services Administration (GSA) for a system controlling all federal office space, following a default by System Development Corp. (SDC).

## Tie to Infont

The contract, to be completed over the next nine months, is to tie into the government's use of Infont. It will enable GSA to monitor office space and watch building construction programs.

A spokesman for SDC said he believed the system is "largely operational now." SDC has been working on the system since June 1973, and before that it had successfully completed an \$800,000 contract for study and system analysis for the project.

"We have had our differences of opinion with GSA as to what the contract requirements are," the SDC spokesman said.

"We are pursuing with the agency appropriate administrative means of remedying the situation," he added.

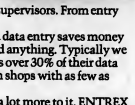
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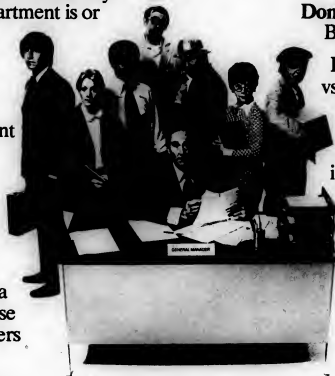
And so on.

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If you're interested in high-performance systems offering decentralized control and custom applications software, our new DM-100 family is the right way to go.



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#### **The performance-oriented family.**

Our DM-100 family consists of systems for remote job entry (DM-120), satellite processing (DM-130) and powerful central processing centers (DM-140)—each built around our high-performance SPC-16 computer. When tied together, they form a compatible network of products that can communicate with each other and provide upward expandability where you need it when you need it.

A number of specific industry-oriented application programs are available for use with the DM-100 family. We also offer general libraries for statistical analysis, operations research and financial planning. If needed, we'll work with you to develop custom solutions for your particular applications.

We also make a special low-cost, highly interactive system. It's called the DM-130/2 and has just about the same specs as the DM-130, but without the range of expandability. (It is available through a separate, nationwide network of distributors established to handle the special turn-key business system requirements of first-time users.)

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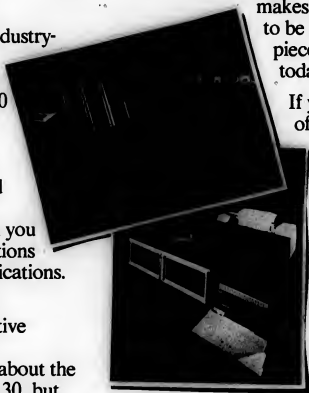
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When we were first with the 16K word core memory board in 1971, it sent a lot of people scurrying back to their drawing tables.

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32K words of core memory on a single board. Same size as our 16K board. Fits the same rack. But with 32K words.

## Lower prices.

Because we can put together the new 32K word memory board for a lot less money than two 16K boards, it means we can actually lower the price of a ModComp computer with 32K (or more) words of memory. Not just a little. A lot. Eighteen to twenty-five per cent.

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These days, with the price of just about everything going out of sight, that's good news in itself. But there's more.

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MAXNET is a standardized operating system designed to run multiple ModComp computers linked together in a distributed network.

The advantages of distributed networks in large systems are by now well established.

Better reliability, because tasks can be distributed among several satellites. So that if one computer shuts down it doesn't shut down the whole system.

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\* Prices are even lower on volume orders.

More efficient planning, because you can add on satellite systems as you need them. Rather than trying to figure out now what your needs might be five years from now.

Better economy, because you don't have to buy a whole lot of little-used peripherals for each individual system.

These and a lot of other advantages make network systems the way to go. Now, and for the years ahead.

But, much as you may be sold on the network concept, you're not all that interested in having a bunch of hardware dropped on your doorstep, and you have to figure out how to tie it all together (or waste a lot of time and more money having someone else figure it out for you).

What MAXNET does is provide you with a standard off-the-shelf operating system that lets you plug in your ModComp network and get it going. Now. Not maybe a year and a zillion dollars from now.

So you get higher performance out of your network at less cost than anyone else in the world can offer you. Bar none.

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## T/S Firms Report Quarter Gains

Two time-sharing firms, Tymshare, Inc. and Comshare, Inc., reported higher quarterly revenues and earnings.

Tymshare third-quarter earnings jumped 77% on a 39% gain in revenues. Earnings for the period totaled \$747,787 or 24 cents a share compared with \$423,203 or 17 cents a share in the same year-ago quarter.

Revenues rose to \$8.8 million compared with \$6.3 million in the 1973 period.

Nine-month results also showed improvements at Tymshare. Earnings totaled nearly \$2 million or 64 cents a share compared with \$1.4 million or 47 cents a share, including a \$258,000 special credit, in the same period last year.

Revenues for the nine months stood at \$23.9 million, up from \$17.5 million a year ago.

Comshare's first-quarter revenues, swelled by a \$300,000 credit from the sale of computer and communications equipment to a Japanese affiliate, totaled \$2.9 million compared with \$2.1 million in the same quarter last year.

Earnings grew to a rotated \$501,000 or 37 cents a share, including \$172,000 credit, compared with \$131,924 or 8 cents a share for the same period last year, when there was a \$66,000 credit.

Results were restated to expense R&D costs as incurred. The firm wrote off \$1.1 million in previously deferred development costs.

## Revenues 28% Higher In Calcomp Quarter

ANAHEIM, Calif. - First-quarter revenues rose 28% at California Computer Products, Inc., but earnings couldn't match those of a year ago when there was a \$537,000 special credit.

Operating earnings, however, did show an increase. During the 1974 period, the firm earned \$781,000 or 25 cents a share compared with \$1.3 million or 42 cents a year ago. But the 1973 operating income was \$715,000 or 24 cents a share.

Revenues reached \$32.9 million compared with \$25.7 million in the year-ago first quarter.

## Acquisitions

Unitrode Corp. and Solid State Scientific, Inc. have reached a preliminary merger agreement. They will form a new company, Solid State Scientific/Unitrode, Inc.

Standard Computer Corp. has agreed to acquire all of the outstanding stock of Kilson Industries, Inc., a printed circuit board manufacturer.

Memotech Computer Systems, Inc. has acquired a controlling interest in Coordinated Computer Concepts, Inc. for a cash investment. Memotech is also supplying Coordinated Computer with a management and operations team.

University Computing Co. (UCC) has completed the sale of substantially all the assets of its aerospace computing division to LTV Aerospace Corp. Under the terms of the sale agreement, UCC will furnish computer consulting services to LTV Aerospace for a two-year period.

## New Registrations

ITEL CORP., One Embarcadero Center, San Francisco, Calif. 94111, a financial, transportation and data processing firm, filed to register up to \$30,477,000 of debentures, due 1999, to be offered in exchange for its 7% convertible subordinated debentures, due 1995, and 8% convertible subordinated debentures, due 1986. No underwriter is involved.

DATA 100 CORP., 7725 Washington Ave., S. Minneapolis, Minn. 55425, a computer lease manufacturer, filed to register 460,000 shares of common in exchange for the assets of Odac, Inc. and subsidiary, at the rate of approximately .23 shares for each Odac share outstanding. No underwriter is involved.

TYMSHARE, INC., 10340 Bluff Road, Cupertino, Calif. 95014, a remote access computer service firm, filed to register 650,000 shares of common in exchange for the assets of common of United Safe Centers, Inc. (USC), Greenwich, Conn., at the rate of .45173 of a Tymshare share for each USC share, pursuant to the statutory merger of USC into a wholly owned subsidiary of Tymshare. No underwriter is involved.

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## Lease Base Strengthens Data 100's Revenues

MINNEAPOLIS — Remote batch equipment maker Data 100 Corp. showed record earnings and revenues for the third quarter and nine months as its growing lease base yielded increased revenues.

Shipments of large batch computer terminal systems were up 34% over the first nine months of last year for a total of 1,050 systems.

Revenues for the nine months totaled \$48.1 million compared with \$28.2 million in the year-to-date period. Sales to end users represented \$14.6 million compared with \$5.1 million a year earlier.

Service and rental revenues reached \$20.2 million for the nine months, up 79% from the \$11.3 million last year. Non-rental sales to third-party leasing companies totaled \$13.2 million compared with \$2.2 million in the year-to-date period.

Nine-month earnings, including a \$1.3 million tax credit, reached \$3.2 million or 56 cents a share compared with \$2.2 million.

## ADP Sets First-Quarter Record

CLIFTON, N.J. — First-quarter earnings and revenues reached record proportions for that period at Automatic Data Processing, Inc. (ADP).

Results from the firm's financial services division were better than those of last year's first quarter, but commercial and special industry services for the period were well ahead of those of the corresponding year-to-date period, President Frank R. Lautenberg said.

ADP has begun charging current systems development costs

tion or 39 cents a share in the year-to-date period, when there was a \$1.1 million credit.

President Edward D. Orenstein noted earnings from operations reached \$7.7 million, double the level of the year-to-date period.

However, the gain was partially offset by increased interest expenses resulting from a substantially higher level of borrowing at higher interest rates, he said.

In the third quarter, revenues rose to \$18.2 million or the year-to-date figure of \$11.1 million. During the 1974 period, \$4.2 million was from nonrecourse sales to third-party leasing companies, while this market accounted for \$4.8 million in the same 1973 period.

Data 100's third-quarter earnings totaled \$1.3 million or 22 cents a share, including a \$547,000 tax credit, compared with \$1 million or 16 cents a share in the year-to-date period, when there was a \$489,000 tax credit.

Revenues rose to \$31 million from \$25.1 million in the 1973 quarter.

Earnings reached \$2.4 million or 38 cents a share compared with nearly \$2 million or 32 cents a share in the year-to-date period.

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| <p><b>FOR SALE BY OWNER</b></p> <p>Video Systems Corp.<br/>VS-100 Invention<br/>Data Storage &amp; Retrieval System<br/>-Data Disc 7200 Series<br/>-Data Memory<br/>-4 1/2" TT Tapes<br/>-Centronics Model 101 Print.</p> <p><b>AVAILABLE IMMEDIATELY</b></p> <p>Contact: R.E. Sackett, Co.<br/>P.O. Box 8<br/>New Canaan, Ct. 06840<br/>(203) 676-8078</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p><b>FACULTY POSITION</b></p> <p>Teaching<br/>Data Processing<br/>and Information Systems</p> <p>The College of Business at Northern Illinois University is seeking a faculty member with M.S. or a Ph.D. in business to teach in the undergraduate and graduate level.</p> <p>Contact: Dr. E.E. Morris<br/>Word Hall 323<br/>Northern Illinois University<br/>DeKalb, Illinois 60151<br/>An Equal Opportunity Employer</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <p><b>Atlanta</b></p> <p><b>NEW ORLEANS</b></p> <p><b>LOS ANGELES</b></p> <p>Our National firm has several client listings for sales and systems professionals with 3 or more years exposure. Industries include:</p> <p>Banking<br/>Manufacturing<br/>EDP &amp; Services<br/>Oil &amp; Chemical<br/>Food<br/>Textile<br/>Transportation<br/>Utilities</p> <p>Write in strict confidence, including salary history, to:</p> <p>W.D. Taylor<br/>Suite 640, 1200 Miami<br/>Boulevard<br/>Fort Lauderdale, Florida 33301<br/>(713) 229-0886</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p><b>HOWARD associates</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <p><b>FOR SALE BY OWNER</b></p> <p>Video Systems Corp.<br/>VS-100 Invention<br/>Data Storage &amp; Retrieval System<br/>-Data Disc 7200 Series<br/>-Data Memory<br/>-4 1/2" TT Tapes<br/>-Centronics Model 101 Print.</p> <p><b>AVAILABLE IMMEDIATELY</b></p> <p>Contact: R.E. Sackett, Co.<br/>P.O. Box 8<br/>New Canaan, Ct. 06840<br/>(203) 676-8078</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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| <p><b>BUY SELL SWAP</b></p>  <p><b>FOR SALE</b></p> <p>Mohawk: Line Printers<br/>7 &amp; 9 Channel Keytapes<br/>Sale/Rent/Lease</p>                                                                                                                                         | <p><b>BUY SELL SWAP</b></p> <p><b>360/20's<br/>FOR SALE</b></p> <p>All configurations available 30-40 day delivery. Call or write for a quote.</p> <p><b>SELL LEASE TRADE BUY</b></p> <p><b>ECONOCOM, INC.</b><br/>P.O. Box 12114<br/>Memphis, Tenn.<br/>Member Computer Dealers Association</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p><b>BUY SELL SWAP</b></p> <p><b>FOR SALE</b></p> <p>Sycor Model 340 Intelligent Communications Terminal. Sixteen months old. Under maintenance and like new. Easy to program. CRT for visual verification and correction of keyed data. Equipped with nine track mag tape drive and cassette tapes. Priced to sell.</p> <p>Medical Detachment, Inc.<br/>208 Union Bank Bldg.<br/>Tallahassee, FL 32301<br/>(419) 483-6060</p> | <p><b>BUY SELL SWAP</b></p> <p><b>WANTED</b></p> <p>BURROUGHS<br/>I SERIES</p>                                                                                                                                                           | <p><b>BUY SELL SWAP</b></p> <p><b>1401</b></p> <p>Card, Tape &amp; Disk Systems Available</p> <p>CMI Corporation<br/>25000 Route 200<br/>St. Clair Shores, MI 48080<br/>(313) 317-2500<br/>TWX 313-252-9700<br/>Member Computer Dealers Assoc.</p>                                                                                                                                                                                                                                                                                                                                                                                              |                |            |                |         |                |           |                |             |                |        |                |             |                |               |                |          |                |         |              |        |              |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |                |          |                |            |                |         |                |           |                |             |                |        |                |             |                |               |                |          |                |         |              |        |              |       |           |                                                                |                                                                                                                                                                |
| <p><b>SMI</b></p>                                                                                                                                                                                                                                                                                                                                           | <p><b>FOR SALE</b></p> <p><b>IBM 370/155</b></p> <p>2 MEGABYTE AVAILABLE EARLY 1975</p> <p>For information call:<br/>(415) 677-5138<br/>Or write to<br/>CW Box 4237<br/>787 Washington St.<br/>Newtown, Mass. 02459</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p><b>THE SPECIALIST<br/>IN SIGMA<br/>XEROX<br/>BUY/SELL/SERVICE</b></p> <p><b>QUELEX</b><br/>7780 Deering Ave.<br/>Canoga Park, CA<br/>contact C. Fusco<br/>(213) 883-0500</p>                                                                                                                                                                                                                                                 | <p><b>I.O.A. Data Corp.</b></p>                                                                                                                                                                                                          | <p><b>FOR SALE</b></p> <p><b>HONEYWELL<br/>200 SYSTEM<br/>SERIES 15<br/>CONSISTING OF</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |            |                |         |                |           |                |             |                |        |                |             |                |               |                |          |                |         |              |        |              |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |                |          |                |            |                |         |                |           |                |             |                |        |                |             |                |               |                |          |                |         |              |        |              |       |           |                                                                |                                                                                                                                                                |
| <p><b>FOR SALE</b></p> <p><b>UNIVAC 9200 16K CARD SYSTEM<br/>W/1001 CARD CONTROLLER</b></p> <p>250 LPM Printer, 96 POS; 8K Mem. w/200 4K stor. exp.; 400 CPM card rdr.; 75/200 CPM card pch.; Multiplexor I/O channel; 1000/2000 CPM card ctrl; 1001 control; two file feeds.</p> <p><b>AVAILABLE NOW</b><br/>Contact: Gary Johnston<br/>(216) 464-3881</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p><b>WILL BUY<br/>2860-3</b></p>                                                                                                                                                                                                                                                                                                                                                                                               | <p><b>FOR SALE</b></p> <p>2703 (01)<br/>1440-2<br/>7605-10<br/>4680<br/>4610</p> <p><b>FOR SALE</b><br/>IBM M.A.</p> <p>P.C.M. Corp.<br/>2538 Farrington<br/>Dallas, Tex. 75207<br/>(214) 637-0950</p>                                   | <p><b>FOR SALE</b></p> <p>118-3 Central Processor<br/>4172 Disk Drive<br/>204-B-1 magnetic Tape Units<br/>2204-B-2 Magnetic Tape Units<br/>12-3 Line Printer<br/>with soundproofing<br/>214-2 Card Reader/Punch<br/>Available 1-1-75, Contact:<br/>L.M. Vaughan or W.C. Clingman<br/>P.O. Box 19097<br/>Houston, Texas 77024<br/>(713) 467-0000</p>                                                                                                                                                                                                                                                                                             |                |            |                |         |                |           |                |             |                |        |                |             |                |               |                |          |                |         |              |        |              |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |                |          |                |            |                |         |                |           |                |             |                |        |                |             |                |               |                |          |                |         |              |        |              |       |           |                                                                |                                                                                                                                                                |
| <p><b>SALE</b></p> <p><b>IBM 1443 NI</b></p> <p>Available Immediately</p> <p>Computer Resale Exchange Inc.<br/>1737 DeSales Street, N.W.<br/>Washington, D.C. 20036<br/>(202) 737-1401<br/>Member Computer Dealers Assoc.</p>                                                                                                                               | <p><b>FOR SALE OR LEASE</b></p> <p><b>360-30, 128K</b></p> <p>Available 11/01/74<br/>2 channel, FI. Point</p> <p><b>CalComp 2314, 1x6</b><br/>Single or Dual Density</p> <p>To Buy-Sell-Lease<br/>Call collect or write to:<br/>Computer Systems/<br/>Graphics, Inc.<br/>2017 West 104th St.<br/>Leawood, Kansas 66206<br/>(913) 489-2190<br/>Member Computer Dealers Assoc.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p><b>For Sale</b><br/>By Owner<br/>Immediate Delivery</p> <p><b>DEC</b></p> <p>(2) TU10 Tape Drives<br/>&amp; CONTROLLER<br/>\$9500.00</p> <p>R.L. Robertson<br/>Typographic Service Inc.<br/>1027 Arch Street<br/>Philadelphia, Pa. 19107<br/>(215) 923-9000</p>                                                                                                                                                              | <p><b>WANTED</b></p> <p>ALL 360 SYSTEMS</p> <p>360/30 1401 2311 360/20 360/40 360/25</p> <p><b>CORPORATE<br/>COMPUTERS, INC.</b></p> <p>115 Mason St., Greenwich, Conn. 06830 (203) 661-1500<br/>Member Computer Dealers Association</p> | <p><b>FOR SALE</b></p> <p><b>370/165 • 370/155 • 370/145<br/>3830/3330 • 3360</b></p> <p>We have immediate requirements for both purchase and lease of 370/165, 155, and 145 CPU's, 166 wanted for October/November delivery; 145's and 155's for delivery as soon as possible.</p> <p>We also have 165's for sale or lease beginning December 1974. 155's and 145's for sale and lease are available for October and later delivery.</p> <p>3630 &amp; 3330 discs and controllers, as well as 3360-3 and -5 Storage Units are available for immediate delivery.</p> <p>Call IPS for all your medium- and large-scale systems requirements.</p> |                |            |                |         |                |           |                |             |                |        |                |             |                |               |                |          |                |         |              |        |              |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |                |          |                |            |                |         |                |           |                |             |                |        |                |             |                |               |                |          |                |         |              |        |              |       |           |                                                                |                                                                                                                                                                |
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**Sperry Sets Tenth Consecutive Record**

**NEW YORK** - Second-quarter earnings and revenues reported by the Sperry Rand Corp. set a record for the tenth consecutive quarter.

Continuing its streak of record-breaking quarters, the company reported earnings reached \$29.5 million or 86 cents a share, a 15% rise over the \$25.6 million or 75 cents a share reported in the same year-ago period.

Revenues were up 14% in the quarter to \$721.9 million compared with \$633.9 million in the same period last year.

Revenues from Univac commercial computer business were up 13% in the quarter, while revenues from New Holland farm equipment division jumped 32% ahead and Sperry Vickers hydraulic products were 26% above those of last year's quarter.

**Six Months**

During the six months, earnings totaled \$56.1 million or \$1.63 a share, up 14% over \$49.2 million or \$1.43 a share in the 1973 period.

**15% Revenue Rise****Burroughs Expects to Meet Goal**

**LOS ANGELES** - Burroughs Corp. expects a good fourth quarter and anticipates 1974 revenue growth will equal or exceed the target of 15% to 17% increase over 1973, Burroughs chairman Ray W. Macdonald said recently at a meeting of financial analysts here.

In addition, the company looks to 1975 as "another good year for growth in revenue and earnings," he added.

Reflecting on the current economic conditions, Macdonald said "we may be well past the half-way mark in the current slowdown/recession," although he noted no one can predict the duration.

Burroughs is "optimistic" regarding its

**Results Hit New High  
In Wang Labs Quarter**

**TEWKSBURY, Mass.** - First-quarter earnings and revenues were at a record high at Wang Laboratories, Inc., bolstered by demand for the firm's System 2200 computer/calculator.

Earnings for the period ended Sept. 30 rose to \$878,000 or 22 cents a share compared with \$818,000 or 20 cents a share in the year-ago period.

Revenues rose 23% to \$15.8 million from \$12.9 million in the same 1973 period.

Income orders rose to \$18.1 million, an increase of 42% over the first quarter a year ago, Wang, the company's president, said.

Revenues for the first half rose 16% to \$1.4 billion compared with \$1.2 billion for the same period last year.

On a 12-month running basis, earnings were up 17% to \$119.6 million and revenues 15% to \$2.4 billion over those for the year ended Sept. 30, 1973.

"Our customers were better than planned in most of our businesses," said J. Paul Lyet, Sperry's chairman.

Backlog as of Sept. 30 was \$1.87 billion, 10% higher than that of a year ago. The consolidation of the Sperry Remington office equipment division into the Sperry Univac Division is progressing satisfactorily, he said.

performance during the slowdown, he said, adding the rate of gain in incoming orders is three times as high as it was during a comparable period in the 1969-70 recession.

Order levels reflect evidence that "chronic inflation" is "fueling the demand for computers... which permit companies to improve the efficiency and control of their operations," Macdonald remarked.

Burroughs is "a much stronger company in terms of its products, its marketing organization, its financial position and its engineering and manufacturing resources" compared with 1969, he said.

The company's worldwide marketing force has grown 30% to 26,000 people during the past five years, and revenue has increased over 100%, he added.

President Paul S. Mirabito noted in recent years Burroughs "has been able to generate sufficient funds internally to satisfy all debt maturities, dividend payments, fixed asset growth needs and working capital requirements to support the growth of our business, which will have doubled from 1969 to the end of this year."

Burroughs research and development expenses are expected to exceed \$80 million this year and \$100 million next year, which Mirabito called "a significant milestone in our history."

At the nine-month period the firm is "running very close" to its plan to increase worldwide equipment production volumes by 36% over last year.



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## Earnings Reports

## MICROFORM DATA SYSTEMS

| Year Ended Aug. 2 | 1974        | 1973        |
|-------------------|-------------|-------------|
| Revenue           | \$2,784,000 | \$3,126,000 |
| Earnings          | 186,198     | (1,452,726) |

## COMPUTER SCIENCES

| Three Months Ended Sept. 27 | 1974       | 1973       |
|-----------------------------|------------|------------|
| Revenue                     | 42,446,000 | 36,079,000 |
| Earnings                    | 656,000    | 247,000    |
| 6 Mo Shr                    | 12,375     | 10,000     |
| Revenue                     | 1,441,000  | 428,000    |

## ITEK

| Three Months Ended Sept. 27 | 1974         | 1973         |
|-----------------------------|--------------|--------------|
| Revenue                     | \$47,038,000 | \$47,647,000 |
| Earnings                    | (968,000)    | 991,000      |
| 9 Mo Shr                    | 143,284      | 147,855      |
| Revenue                     | 1815,000     | 3,646,000    |

## GOLD

| Three Months Ended Sept. 30 | 1974        | 1973        |
|-----------------------------|-------------|-------------|
| Revenue                     | 207,000,000 | 172,000,000 |
| Earnings                    | 8,600,000   | 5,900,000   |

## CONTROL DATA

| Three Months Ended Sept. 31 | 1974    | 1973    |
|-----------------------------|---------|---------|
| Revenue                     | 285,228 | 231,929 |
| Earnings                    | 150     | (113)   |
| 9 Mo Shr                    | (6,978) | 13,327  |
| Revenue                     | 617,958 | 670,264 |
| Earnings                    | 150     | 286     |
| Revenue                     | 19,730  | 45,667  |

## DECISION DATA COMPUTER

| Three Months Ended Sept. 31 | 1974    | 1973       |
|-----------------------------|---------|------------|
| Revenue                     | 1,111   | 84,906,000 |
| Tax Cred                    | 198,000 |            |
| Earnings                    | 22      | (245,000)  |
| 9 Mo Shr                    | 27,924  | 12,211,000 |
| Revenue                     | 390,000 | (927,000)  |

## CENTRONICS DATA

| Three Months Ended Sept. 30 | 1974      | 1973      |
|-----------------------------|-----------|-----------|
| Revenue                     | 836       | 837       |
| Earnings                    | 1,840,000 | 8,507,967 |
| Earnings                    | 1,840,000 | 1,785,315 |

## COMPUTER AUTOMATION

| Three Months Ended Sept. 29 | 1974      | 1973      |
|-----------------------------|-----------|-----------|
| Revenue                     | 812       | 824       |
| Earnings                    | 5,136,982 | 3,904,995 |
| Earnings                    | 150,318   | 396,780   |

## DIGITAL COMPUTER

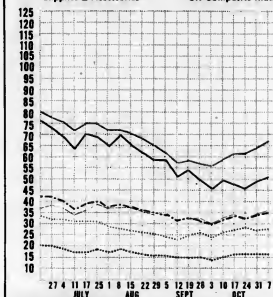
| Three Months Ended Sept. 31 | 1974      | 1973       |
|-----------------------------|-----------|------------|
| Revenue                     | 8,503     |            |
| Earnings                    | 2,635,000 | 13,497,141 |
| Earnings                    | 53,101    | (45,962)   |
| Revenue                     | 4,956,465 | 2,732,013  |
| Earnings                    | 1,111     | 43,000     |
| Earnings                    | 56,498    | (68,577)   |

## ELECTRONIC MEMORIES

| Three Months Ended Sept. 28 | 1974       | 1973       |
|-----------------------------|------------|------------|
| Revenue                     | 27,870,000 | 26,785,000 |
| Earnings                    | 588,000    | 1,028,000  |
| Earnings                    | 1,311,000  | 2,261,000  |
| Revenue                     | 85,447,000 | 78,429,000 |
| Earnings                    | 2,298,000  | 2,476,000  |
| Earnings                    | 5,221,000  | 5,787,000  |

## COMPUTERWORLD Stock Trading Summary

- Computer Systems
- Peripherals & Subsystems
- Supplies & Accessories
- Software & EDP Services
- Lessing Companies
- COM Composite Index



## Computerworld Stock Trading Summary

All statistics compiled, collected and formatted by TRADEQUOTES, INC. Cambridge, Mass. 02139

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| C                                       | S | M | H | L | O | P | V | T | B | C                                       | I | D | E | F | G | H | J | K | L | M                                       | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | AA | AB | AC | AD | AE | AF | AG | AH | AI | AJ | AK | AL | AM | AN | AO | AP | AQ | AR | AS | AT | AU | AV | AW | AX | AY | AZ | BA | BB | BC | BD | BE | BF | BG | BH | BI | BJ | BK | BL | BM | BN | BO | BP | BQ | BR | BS | BT | BU | BV | BW | BX | BY | BZ | CA | CB | CC | CD | CE | CF | CG | CH | CI | CJ | CK | CL | CM | CN | CO | CP | CQ | CR | CS | CT | CU | CV | CW | CX | CY | CZ | DA | DB | DC | DD | DE | DF | DG | DH | DI | DJ | DK | DL | DM | DN | DO | DP | DQ | DR | DS | DT | DU | DV | DW | DX | DY | DZ | EA | EB | EC | ED | EE | EF | EG | EH | EI | EJ | EK | EL | EM | EN | EO | EP | EQ | ER | ES | ET | EU | EV | EW | EX | EY | EZ | FA | FB | FC | FD | FE | FF | FG | FH | FI | FJ | FK | FL | FM | FN | FO | FP | FQ | FR | FS | FT | FU | FV | FW | FX | FY | FZ | GA | GB | GC | GD | GE | GF | GG | GH | GI | GJ | GK | GL | GM | GN | GO | GP | GQ | GR | GS | GT | GU | GV | GW | GX | GY | GZ | HA | HB | HC | HD | HE | HF | HG | HH | HI | HJ | HK | HL | HM | HN | HO | HP | HQ | HR | HS | HT | HU | HV | HW | HX | HY | HZ | IA | IB | IC | ID | IE | IF | IG | IH | II | IJ | IK | IL | IM | IN | IO | IP | IQ | IR | IS | IT | IU | IV | IW | IX | IY | IZ | JA | JB | JC | JD | JE | JF | JG | JH | JI | JJ | JK | JL | JM | JN | JO | JP | JQ | JR | JS | JT | JU | JV | JW | JX | JY | JZ | KA | KB | KC | KD | KE | KF | KG | KH | KI | KJ | KL | KM | KN | KO | KP | KQ | KR | KS | KT | KU | KV | KW | KX | KY | KZ | LA | LB | LC | LD | LE | LF | LG | LH | LI | LJ | LK | LM | LN | LO | LP | LQ | LR | LS | LT | LU | LV | LW | LX | LY | LZ | MA | MB | MC | MD | ME | MF | MG | MH | MI | MJ | MK | ML | MN | MO | MP | MQ | MR | MS | MT | MU | MV | MW | MX | MY | MZ | NA | NB | NC | ND | NE | NF | NG | NH | NI | NJ | NK | NL | NM | NN | NO | NP | NQ | NR | NS | NT | NU | NV | NW | NX | NY | NZ | OA | OB | OC | OD | OE | OF | OG | OH | OI | OJ | OK | OL | OM | ON | OO | OP | OQ | OR | OS | OT | OU | OV | OW | OX | OY | OZ | PA | PB | PC | PD | PE | PF | PG | PH | PI | PJ | PK | PL | PM | PN | PO | PP | PQ | PR | PS | PT | PU | PV | PW | PX | PY | PZ | QA | QB | QC | QD | QE | QF | QG | QH | QI | QJ | QK | QL | QM | QN | QO | QP | QQ | QR | QS | QT | QU | QV | QW | QX | QY | QZ | RA | RB | RC | RD | RE | RF | RG | RH | RI | RJ | RK | RL | RM | RN | RO | RP | RQ | RR | RS | RT | RU | RV | RW | RX | RY | RZ | SA | SB | SC | SD | SE | SF | SG | SH | SI | SJ | SK | SL | SM | SN | SO | SP | SQ | SR | SS | ST | SU | SV | SW | SX | SY | SZ | TA | TB | TC | TD | TE | TF | TG | TH | TI | TJ | TK | TL | TM | TN | TO | TP | TQ | TR | TS | TT | TU | TV | TW | TX | TY | TZ | UA | UB | UC | UD | UE | UF | UG | UH | UI | UJ | UK | UL | UM | UN | UO | UP | UQ | UR | US | UT | UU | UV | UW | UX | UY | UZ | VA | VB | VC | VD | VE | VF | VG | VH | VI | VJ | VK | VL | VM | VN | VO | VP | VQ | VR | VS | VT | VU | VV | VW | VX | VY | VZ | WA | WB | WC | WD | WE | WF | WG | WH | WI | WJ | WK | WL | WM | WN | WO | WP | WQ | WR | WS | WT | WU | WV | WW | WX | WY | WZ | XA | XB | XC | XD | XE | XF | XG | XH | XI | XJ | XK | XL | XM | XN | XO | XP | XQ | XR | XS | XT | XU | XV | XW | XX | XY | XZ | YA | YB | YC | YD | YE | YF | YG | YH | YI | YJ | YK | YL | YM | YN | YO | YP | YQ | YR | YS | YT | YU | YV | YW | YX | YZ | ZA | ZB | ZC | ZD | ZE | ZF | ZG | ZH | ZI | ZJ | ZK | ZL | ZM | ZN | ZO | ZP | ZQ | ZR | ZS | ZT | ZU | ZV | ZW | ZX | ZY | ZZ |
| [C] [C] [C] [C] [C] [C] [C] [C] [C] [C] |   |   |   |   |   |   |   |   |   | [C] [C] [C] [C] [C] [C] [C] [C] [C] [C] |   |   |   |   |   |   |   |   |   | [C] [C] [C] [C] [C] [C] [C] [C] [C] [C] |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| C                                       | S | M | H | L | O | P | V | T | B | C                                       | I | D | E | F | G | H | J | K | L | M                                       | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | AA | AB | AC | AD | AE | AF | AG | AH | AI | AJ | AK | AL | AM | AN | AO | AP | AQ | AR | AS | AT | AU | AV | AW | AX | AY | AZ | BA | BB | BC | BD | BE | BF | BG | BH | BI | BJ | BK | BL | BM | BN | BO | BP | BQ | BR | BS | BT | BU | BV | BW | BX | BY | BZ | CA | CB | CC | CD | CE | CF | CG | CH | CI | CJ | CK | CL | CM | CN | CO | CP | CQ | CR | CS | CT | CU | CV | CW | CX | CY | CZ | DA | DB | DC | DD | DE | DF | DG | DH | DI | DJ | DK | DL | DM | DN | DO | DP | DQ | DR | DS | DT | DU | DV | DW | DX | DY | DZ | EA | EB | EC | ED | EE | EF | EG | EH | EI | EJ | EK | EL | EM | EN | EO | EP | EQ | ER | ES | ET | EU | EV | EW | EX | EY | EZ | FA | FB | FC | FD | FE | FF | FG | FH | FI | FJ | FK | FL | FM | FN | FO | FP | FQ | FR | FS | FT | FU | FV | FW | FX | FY | FZ | GA | GB | GC | GD | GE | GF | GG | GH | GI | GJ | GK | GL | GM | GN | GO | GP | GQ | GR | GS | GT | GU | GV | GW | GX | GY | GZ | HA | HB | HC | HD | HE | HF | HG | HH | HI | HJ | HK | HL | HM | HN | HO | HP | HQ | HR | HS | HT | HU | HV | HW | HX | HY | HZ | IA | IB | IC | ID | IE | IF | IG | IH | II | IJ | IK | IL | IM | IN | IO | IP | IQ | IR | IS | IT | IU | IV | IW | IX | IY | IZ | JA | JB | JC | JD | JE | JF | JG | JH | JI | JJ | JK | JL | JM | JN | JO | JP | JQ | JR | JS | JT | JU | JV | JW | JX | JY | JZ | KA | KB | KC | KD | KE | KF | KG | KH | KI | KJ | KL | KM | KN | KO | KP | KQ | KR | KS | KT | KU | KV | KW | KX | KY | KZ | LA | LB | LC | LD | LE | LF | LG | LH | LI | LJ | LK | LM | LN | LO | LP | LQ | LR | LS | LT | LU | LV | LW | LX | LY | LZ | MA | MB | MC | MD | ME | MF | MG | MH | MI | MJ | MK | ML | MN | MO | MP | MQ | MR | MS | MT | MU | MV | MW | MX | MY | MZ | NA | NB | NC | ND | NE | NF | NG | NH | NI | NJ | NK | NL | NM | NN | NO | NP | NQ | NR | NS | NT | NU | NV | NW | NX | NY | NZ | OA | OB | OC | OD | OE | OF | OG | OH | OI | OJ | OK | OL | OM | ON | OO | OP | OQ | OR | OS | OT | OU | OV | OW | OX | OY | OZ | PA | PB | PC | PD | PE | PF | PG | PH | PI | PJ | PK | PL | PM | PN | PO | PP | PQ | PR | PS | PT | PU | PV | PW | PX | PY | PZ | QA | QB | QC | QD | QE | QF | QG | QH | QI | QJ | QK | QL | QM | QN | QO | QP | QQ | QR | QS | QT | QU | QV | QW | QX | QY | QZ | RA | RB | RC | RD | RE | RF | RG | RH | RI | RJ | RK | RL | RM | RN | RO | RP | RQ | RR | RS | RT | RU | RV | RW | RX | RY | RZ | SA | SB | SC | SD | SE | SF | SG | SH | SI | SJ | SK | SL | SM | SN | SO | SP | SQ | SR | SS | ST | SU | SV | SW | SX | SY | SZ | TA | TB | TC | TD | TE | TF | TG | TH | TI | TJ | TK | TL | TM | TN | TO | TP | TQ | TR | TS | TT | TU | TV | TW | TX | TY | TZ | UA | UB | UC | UD | UE | UF | UG | UH | UI | UJ | UK | UL | UM | UN | UO | UP | UQ | UR | US | UT | UU | UV | UW | UX | UY | UZ | VA | VB | VC | VD | VE | VF | VG | VH | VI | VJ | VK | VL | VM | VN | VO | VP | VQ | VR | VS | VT | VU | VV | VW | VX | VY | VZ | WA | WB | WC | WD | WE | WF | WG | WH | WI | WJ | WK | WL | WM | WN | WO | WP | WQ | WR | WS | WT | WU | WV | WW | WX | WY | WZ | XA | XB | XC | XD | XE | XF | XG | XH | XI | XJ | XK | XL | XM | XN | XO | XP | XQ | XR | XS | XT | XU | XV | XW | XX | XY | XZ | YA | YB | YC | YD | YE | YF | YG | YH | YI | YJ | YK | YL | YM | YN | YO | YP | YQ | YR | YS | YT | YU | YV | YW | YX | YZ | ZA | ZB | ZC | ZD | ZE | ZF | ZG | ZH | ZI | ZJ | ZK | ZL | ZM | ZN | ZO | ZP | ZQ | ZR | ZS | ZT | ZU | ZV | ZW | ZX | ZY | ZZ |
| [C] [C] [C] [C] [C] [C] [C] [C] [C] [C] |   |   |   |   |   |   |   |   |   | [C] [C] [C] [C] [C] [C] [C] [C] [C] [C] |   |   |   |   |   |   |   |   |   | [C] [C] [C] [C] [C] [C] [C] [C] [C] [C] |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| C                                       | S | M | H | L | O | P | V | T | B | C                                       | I | D | E | F | G | H | J | K | L | M                                       | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | AA | AB | AC | AD | AE | AF | AG | AH | AI | AJ | AK | AL | AM | AN | AO | AP | AQ | AR | AS | AT | AU | AV | AW | AX | AY | AZ | BA | BB | BC | BD | BE | BF | BG | BH | BI | BJ | BK | BL | BM | BN | BO | BP | BQ | BR | BS | BT | BU | BV | BW | BX | BY | BZ | CA | CB | CC | CD | CE | CF | CG | CH | CI | CJ | CK | CL | CM | CN | CO | CP | CQ | CR | CS | CT | CU | CV | CW | CX | CY | CZ | DA | DB | DC | DD | DE | DF | DG | DH | DI | DJ | DK | DL | DM | DN | DO | DP | DQ | DR | DS | DT | DU | DV | DW | DX | DY | DZ | EA | EB | EC | ED | EE | EF | EG | EH | EI | EJ | EK | EL | EM | EN | EO | EP | EQ | ER | ES | ET | EU | EV | EW | EX | EY | EZ | FA | FB | FC | FD | FE | FF | FG | FH | FI | FJ | FK | FL | FM | FN | FO | FP | FQ | FR | FS | FT | FU | FV | FW | FX | FY | FZ | GA | GB | GC | GD | GE | GF | GG | GH | GI | GJ | GK | GL | GM | GN | GO | GP | GQ | GR | GS | GT | GU | GV | GW | GX | GY | GZ | HA | HB | HC | HD | HE | HF | HG | HH | HI | HJ | HK | HL | HM | HN | HO | HP | HQ | HR | HS | HT | HU | HV | HW | HX | HY | HZ | IA | IB | IC | ID | IE | IF | IG | IH | II | IJ | IK | IL | IM | IN | IO | IP | IQ | IR | IS | IT | IU | IV | IW | IX | IY | IZ | JA | JB | JC | JD | JE | JF | JG | JH | JI | JJ | JK | JL | JM | JN | JO | JP | JQ | JR | JS | JT | JU | JV | JW | JX | JY | JZ | KA | KB | KC | KD | KE | KF | KG | KH | KI | KJ | KL | KM | KN | KO | KP | KQ | KR | KS | KT | KU | KV | KW | KX | KY | KZ | LA | LB | LC | LD | LE | LF | LG | LH | LI | LJ | LK | LM | LN | LO | LP | LQ | LR | LS | LT | LU | LV | LW | LX | LY | LZ | MA | MB | MC | MD | ME | MF | MG | MH | MI | MJ | MK | ML | MN | MO | MP | MQ | MR | MS | MT | MU | MV | MW | MX | MY | MZ | NA | NB | NC | ND | NE | NF | NG | NH | NI | NJ | NK | NL | NM | NN | NO | NP | NQ | NR | NS | NT | NU | NV | NW | NX | NY | NZ | OA | OB | OC | OD | OE | OF | OG | OH | OI | OJ | OK | OL | OM | ON | OO | OP | OQ | OR | OS | OT | OU | OV | OW | OX | OY | OZ | PA | PB | PC | PD | PE | PF | PG | PH | PI | PJ | PK | PL | PM | PN | PO | PP | PQ | PR | PS | PT | PU | PV | PW | PX | PY | PZ | QA | QB | QC | QD | QE | QF | QG | QH | QI | QJ | QK | QL | QM | QN | QO | QP | QQ | QR | QS | QT | QU | QV | QW | QX | QY | QZ | RA | RB | RC | RD | RE | RF | RG | RH | RI | RJ | RK | RL | RM | RN | RO | RP | RQ | RR | RS | RT | RU | RV | RW | RX | RY | RZ | SA | SB | SC | SD | SE | SF | SG | SH | SI | SJ | SK | SL | SM | SN | SO | SP | SQ | SR | SS | ST | SU | SV | SW | SX | SY | SZ | TA | TB | TC | TD | TE | TF | TG | TH | TI | TJ | TK | TL | TM | TN | TO | TP | TQ | TR | TS | TT | TU | TV | TW | TX | TY | TZ | UA | UB | UC | UD | UE | UF | UG | UH | UI | UJ | UK | UL | UM | UN | UO | UP | UQ | UR | US | UT | UU | UV | UW | UX | UY | UZ | VA | VB | VC | VD | VE | VF | VG | VH | VI | VJ | VK | VL | VM | VN | VO | VP | VQ |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

# COM TO THE POINT: MEMOREX AT \$1,255 A MONTH.

The reason why 90 percent of all on-line COM systems in the world are Memorex Systems is simple: a complete Memorex COM system (excluding viewer) costs only \$1,255 a month—less than one-half the price of competitive systems.

That's the first reason why independent EDP managers use Memorex COM.

But the savings don't stop there. Because Memorex LED/fiber optics technology is the most advanced in the field, your maintenance costs with a Memorex COM system are less than one-half your maintenance costs with competing systems.

Easy to operate with its prepackaged film, a Memorex on-line COM system appears as a 2821/1403 printer combination to your IBM 360/370. That means no software changes when you attach a Memorex 1600 COM system to your computer.

And once it's attached, you'll see why Memorex COM is making line printers obsolete.

Up to 10,000 lines a minute gives you a speed ten times faster than a line printer. At one manufacturing company, this increased speed saved an extra 80 hours a month of computer time for data processing.

Memorex COM not only saves you paper costs—one public utility saves more than 50 tons of paper a month by using Memorex COM—but it saves you about 98 percent of the storage space required by paper.

So, when you install COM, Count On Memorex for the highest performance at the lowest cost. Memorex supports you, the EDP manager, with its complete line of COM products and supplies and its worldwide sales and service organization. Write for a free COM information kit today. Memorex Corporation, San Tomas at Central Expressway, Santa Clara, California 95052.



**MEMOREX**  
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